

# Marc V. d'Entremont, Ph.D. Candidate, R.P.Bio

## Senior Wildlife Biologist, LGL Limited

### PERSONAL PROFILE

Marc d'Entremont is a Registered Professional Biologist with 24 years of experience in natural resources research and management, and environmental sciences, with the past 13 years in environmental consulting. Mr. d'Entremont serves as a key senior resource for work relating to regulatory affairs, environmental assessment legislation, and assessments of impacts to birds, wildlife and terrestrial and marine resources.

### EDUCATION

- Ph.D. Candidate, Natural Resources and Environmental Studies. University of Northern British Columbia, Prince George, B.C., 2009 – 2015 (expected)
- M.Sc. Environment and Management. Royal Roads University, Victoria, B.C., 2004
- Forestry Technician, Natural Environment and Outdoor Studies. Sault College of Applied Arts and Technology, Sault Ste. Marie, Ont., 1992
- B.Sc. Biology. Acadia University, Wolfville, N.S., 1989

### RELEVANT EXPERIENCE

#### Wind Energy

##### **2012 – 2014: Nulki Hills Wind Project, Innergex Renewable Energy Inc., Vanderhoof, B.C.**

- As Discipline Manager, assisted client with baseline surveys and development of the environmental assessment application information requirements.
- Provided technical support on the bird, bat and terrestrial wildlife components for the project.

##### **2005 – 2006: Dokie Wind Energy Project, Dokie Wind Energy Inc., Chetwynd, B.C.**

- As Project Manager, assisted client in successfully receiving environmental assessment certificates for the Dokie Wind Energy project.
- Provided technical support on bird, wildlife, fisheries, vegetation and terrain components for the project.
- Provided environmental coordination and monitoring services to support the preparation of environmental management plans, permits and approval for the 72 MW wind energy facility in northeastern British Columbia.

##### **2005: Wartenbe Wind Energy Project, Dokie Wind Energy Inc., Chetwynd, B.C.**

- As Project Manager, assisted client in successfully receiving environmental assessment certificates for the Wartenbe Wind Energy project.
- Provided technical support on bird, wildlife, fisheries, vegetation and terrain components for the project.

**2007: Two Unnamed Wind Energy Projects, EarthFirst Canada Inc., Peace Region, B.C.**

- As Project Manager, assisted client with baseline surveys to support the environmental assessment for two potential 100 MW wind projects in the Peace Region of B.C. Technical support on wildlife, fisheries and terrain components was provided.

**2007: Unnamed Wind Energy Project, EarthFirst Canada Inc., Chilcotin Region, B.C.**

- As Project Manager, assisted client with regulatory consultation and mitigation planning for the installation of meteorological tower at a potential wind energy facility in the Chilcotin Region of B.C. Mitigation of potential impacts to big horn sheep was the primary issue for this project.

**2007: Ostrander Point Wind Power Project, Gilead Power Corporation, Peterborough, Ont.**

- As Senior Reviewer, provided input and advice to pre- and post-construction wildlife monitoring plans.

**Power and Transmission**

**2012 – 2013: Site C Clean Energy Project, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of Environmental Impact Statement guidelines for this project. Specific issues and concerns relate to the potential downstream effects of the proposed project.

**2012 – 2013: Taltson Hydroelectric Project, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of water license renewal materials.
- Compiled relevant terrestrial information relating to potential compensation measures.

**2010: Environmental Support Service, BC Hydro, Burnaby, B.C.**

- Provided support to BC Hydro Environment and Social Issues – Generation as an in-house contractor. Support included the preparation of environmental management plans, managing environmental monitoring contracts and consulting with project teams to identify project specific environmental concerns related to generation capital projects.

**2010: Popkum Residential Subdivision Development, Bridal Fall, B.C.**

- As Senior Reviewer, provided input and advice on baseline surveys and the preparation of the environmental assessment under CEAA for the project. Particular attention was focused on species at risk identified under SARA.

**2010: Stelkia Ranch Residential Subdivision, Oliver, B.C.**

- As Senior Reviewer, provided input and advice on baseline surveys and the preparation of the environmental assessment under CEAA for the project. Particular attention was focused on species at risk identified under SARA.

**2008: Tofino Distribution Feeder Project, BC Hydro, Tofino, B.C.**

- As Project Manager, assisted the client in successfully receiving environmental assessment certificates for the project under CEAA. Consultation with Parks Canada was the primary driver since the project went through Pacific Rim National Park.

**2005 – 2006: Vancouver Island Transmission Reinforcement Project, British Columbia Transmission Corporation / BC Hydro, Lower Mainland, B.C.**

- As Discipline Manager, conducted the effects assessments on terrestrial resources (wildlife, vegetation, ecosystem communities) and marine birds for a 62 km upgrade to existing transmission lines from Tsawwassen to Vancouver Island. Assessments were completed under CEAA/BCEAA.

**2006: Control Centres, British Columbia Transmission Corporation, Vernon and Langley, B.C.**

- As Project Manager, assisted the client in preparing environmental assessments and identifying municipal and provincial permit requirements for two new secondary control centers for use in its operations and energy management system.

**Urban**

**2014: Elk / Beaver Lake Dam Upgrade, Saanich, B.C.**

- As Project Biologist, conducted a biophysical assessment of the project area in the vicinity of the proposed dam upgrade at the outlet of Beaver Lake into Colquitz Creek. The assessment included a survey of bird and wildlife habitats and terrestrial ecosystems. Input was provided into the design drawings for the dam and the environmental management plan.

**2013-2014: Arbutus Road Attenuation Tank, Saanich, B.C.**

- As Project Biologist, conducted a biophysical assessment of the Haro Woods located on Arbutus Road east of the University of Victoria. The assessment included a survey of bird and wildlife habitats, terrestrial ecosystems and aquatic resources. Input was provided into the design drawings for the tank.

**2013: Eagle Nest Monitoring, Oak Bay, B.C.**

- As Project Biologist, monitored the behavior of adult and juvenile bald eagles at a nest in a residential area of Oak Bay. The nest was adjacent to a residential development.

**2012 – 2013: Jesken Town Centre, Tsawout First Nation, B.C.**

- As Project Biologist, conducted a biophysical assessment of the forested property within the East Saanich Indian Reserve. The assessment included a survey of bird and wildlife habitats and terrestrial ecosystems. Input was provided into the management plan and short and long-term options for management of the riparian areas.

**2007 – 2008: Central Park Management Plan, City of Burnaby, B.C.**

- As Project Manager, conducted a biophysical assessment of Central Park located in the heart of Burnaby, B.C. The assessment included a survey of bird and wildlife habitats, terrestrial ecosystems and aquatic resources. Input was provided into the management plan and short and long-term options for park redevelopment.

**2005 – 2006: Cypress Venue, Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC), Cypress Provincial Park, West Vancouver, B.C.**

- As Project Manager, completed the environmental assessment for the 2010 Winter Olympics freestyle skiing and snowboard venues at Cypress Mountain under a cooperative CEAA / BC Park Impact Assessment process. The assessment considered effects on bio-physical and socio-economic valued components as well as the effects of the environment on the project. Key issues were impacts to current recreational activities in the park.

**2004: Cates Park (Whey-ah-Wichen) Master Plan, District of North Vancouver, B.C.**

- As Project Biologist, conducted a biophysical assessment of Cates Park (Whey-ah-Wichen) near Deep Cove, B.C. The assessment included the characterization of ecosystems within the park, the assessment of wildlife corridors and a survey of incidental wildlife observations. This information supported the preparation of a master plan for the park.

**2005: Westhill Park Redevelopment, City of Port Moody, B.C.**

- As Project Biologist, conducted a biophysical assessment of Westhill Park in the City of Port Moody. The assessment included a survey of the old growth forest to determine the potential for nesting raptors and the delineation of wetland habitat within the park.

**2004 – 2005: Biophysical Assessments in an Environmentally Sensitive Area, First Pro, Richmond, B.C.**

- As Project Manager, assessed the condition of an Environmentally Sensitive Area in Richmond, British Columbia and the requirements for completing a development permit application.

**2004: Three Sisters Resort, Canmore, Alta.**

- As Project Biologist, conducted assessment of breeding bird habitat and determined the potential for nesting raptors on site.

**Oil and Gas**

**2014: Trans Mountain Pipeline Extension Project, Thompson-Okanagan Region, B.C.**

- As Technical Advisor for the environmental component, working with the Lower Nicola Indian Band to compile scientific evidence to address deficiencies in the Environmental and Socio-economic Assessment prepared for the project by Kinder Morgan Canada Inc. as part of its application package to the National Energy Board. Key concerns are related to impacts to ecosystems, fish and fish habitat, wildlife, traditional land use and cumulative effects.

**2014: North Montney Project, Peace Region, B.C.**

- As Technical Advisor for the environmental component, currently working with the West Moberly First Nation to compile scientific evidence to address deficiencies in the Environmental and Socio-economic Assessment prepared for the project by NOVA Gas Transmission Ltd. as part of its application package to the National Energy Board. Key concerns are related to impacts to ecosystems, fish and fish habitat, wildlife, traditional land use and cumulative effects.

**2011 – 2013: Shell Exploratory Drilling, Shell Oil, Arctic Ocean, Alaska**

- As Project Biologist, provided technical support to design and implement components of the Bird Monitoring and Strike Avoidance Plan for the project. Components included seabird observations and a bird radar study on lease areas within the Chukchi and Beaufort Seas.

**2012 – 2013: Kingsvale-Oliver Reinforcement Project, Lower Nicola Indian Band, Merritt, B.C.**

- As an Environmental Specialist, provided technical support on the review of Environmental Impact Statement guidelines for this project that crosses the traditional territory of the LNIB.

**2005 – 2011: Northern Gateway Pipeline, Enbridge Pipelines Inc., Kitimat, B.C.**

- As Discipline Lead for the marine bird component of the Northern Gateway Pipeline project. Particular emphasis was placed on the marine terminal proposed for Kitimat and the associated shipping routes.
- Conducted shoreline and vessel-based marine bird surveys in Douglas Channel and Principe Channel along the central British Columbia coast.

**2010: Fort Nelson Mainline Pipeline, Spectra Energy Transmission, Hudson's Hope, B.C.**

- As Project Biologist, prepared chapter on wildlife resources for the environmental and socio-economic assessment to support the Section 58 application to the National Energy Board.

**2010: Stewart Lake Pipeline, Spectra Energy Transmission, Dawson Creek, B.C.**

- As Project Biologist, prepared chapter on wildlife resources for the environmental and socio-economic assessment to support the Section 58 application to the National Energy Board. Conducted field work on the wildlife habitat assessment for the project.

**2008 – 2010: Ridley Island LNG Facility, Westpac, Prince Rupert, B.C.**

- As Discipline Manager, conducted the effects assessments on terrestrial and marine birds and wildlife for a transshipment LNG facility near in Prince Rupert, British Columbia. Assessment was completed under CEAA.

**2009: Tank 82 Spill, Kinder Morgan Canada, Burnaby, B.C.**

- As Discipline Manager, conducted regulatory consultation and environmental monitoring of the tertiary containment area. Monitoring included surveys for active bird nests and amphibian salvage.

**2008 – 2009: Cabin Gas Plant, Encana, Fort Nelson, Vancouver, B.C.**

- As Discipline Manager, successfully assisted the client in receiving its environmental assessment certificate for the project. The discipline focused on wildlife resources and surveys for woodland caribou, breeding birds and nesting raptors (e.g., Northern Goshawk) were conducted.

**2007 – 2008: Grizzly Pipeline Looping Spectra Energy Transmission, Tumbler Ridge, B.C.**

- As Project Manager, prepared an environmental and socio-economic assessment to support the Section 58 application to the National Energy Board. Completed baseline investigations for fish

and fish habitat, wildlife and wildlife habitat and vegetation, and provided regulatory advice on key issues and concerns that would influence the routing of the pipeline loop.

**2008: Ajurak Beaufort Sea 3D Seismic Program, Imperial Oil, Inuvik, N.W.T.**

- As Project Biologist, provided training on seabird monitoring protocols to marine mammal monitors. Coordinated the preparation of baseline information on marine birds for the project.

**2009: Pokak 3D Seismic Program, BP Exploration, Inuvik, N.W.T.**

- As Project Biologist, provided training on seabird monitoring protocols to marine wildlife observers.

**2007: Gordondale Compressor Station Upgrades, Spectra Energy Transmission, Gordondale, Alta.**

- As Project Manager, prepared the environmental and socio-economic assessment to support the Section 58 application to the National Energy Board.

**2007: Westridge Oil Spill, Kinder Morgan Canada, Burnaby, B.C.**

- As Logistics Coordinator, provided rapid response of environment teams to monitor the emergency response and environmental clean-up of this oil spill in the terrestrial and marine environments in Burnaby, B.C.

**2005: Sumas Mountain Road Spill, Terasen, Abbotsford, B.C.**

- As Discipline Manager, conducted regulatory consultation and environmental monitoring of the spill site. Monitoring included surveys for Pacific water shrew and amphibian salvage.

**2004 – 2005: South Peace Pipeline, Duke Energy Gas Transmissions, Taylor, B.C.**

- As Project Biologist, conducted wildlife habitat assessments and baseline surveys for the South Peace Pipeline in northeastern British Columbia.

**2004 – 2005: Kitimat LNG Terminal, Kitimat LNG, Kitimat, B.C.**

- As Discipline Manager, conducted the effects assessments on avifauna species for an LNG terminal at Kitimat, British Columbia. Assessment was completed under CEAA/BCEAA.

**2003: Preliminary Screening Guidelines for Seismic Operations, Mackenzie Valley Environmental Impact Review Board, Yellowknife, N.W.T.**

- As Project Manager, developed and compiled criteria for Preliminary Screening guidelines specific to seismic operations under the Mackenzie Valley Resource Management Act.

**Industry**

**2012 – 2013: Shopping Centre Development, Tsawout First Nation, Saanichton, B.C**

- As Discipline Manager, conducted baseline studies and the effects assessments on the terrestrial environment for the shopping centre development on first nation lands on Vancouver Island.

**2011: Prairie Sky Resource Centre, BFI Canada, Blackie, Alta.**

- As Discipline Manager, coordinated the implementation and completion of the biophysical impact assessment for the project. Components included a wetland assessment and surveys for birds, amphibians and terrestrial wildlife.

**2011: Cambie Siding Project, Canadian Pacific Railway, Sicamous, B.C.**

- As Project Biologist, assessed the proposed railway siding project for potential impacts to wildlife resources. The primary species of concern for the project was the Western Painted Turtle.

**2008 – 2010: Fairview Terminal Phase II, Prince Rupert Port Authority, Prince Rupert, B.C.**

- As Discipline Manager, conducted the effects assessments on terrestrial and marine birds and wildlife for a port expansion project in Prince Rupert, British Columbia. Assessment was completed under CEAA.

**2009: Moose Mortality Action Plan, CN Rail, Skeena Region, B.C.**

- As Senior Reviewer, provided input and advice on issues relating to the mortality of moose on subdivision rail lines between Prince George and Prince Rupert. Consultation with regulator and local stakeholders (e.g., Rod and Gun Associations, First Nations) occurred.

**2009: Ewan Branch, CN Rail, Richmond, B.C.**

- As Senior Reviewer, provided input and advice on the environmental assessment prepared under CEAA.

**2009: Fort Saskatchewan Upgrader, CN Rail, Fort Saskatchewan, Alta.**

- As Senior Reviewer, provided input and advice on the environmental assessment prepared under CEAA.

**Mining**

**2011 – 2015: Gahcho Kue Diamond Project, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of the Environmental Impact Statement for the project. Prepared presentation materials for and participated in technical sessions and public hearings for the environmental review and permitting processes.

**2011 – 2015: Snap Lake Diamond Mine, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of the water license renewal application for the project. Prepared presentation materials for and participated in technical sessions and public hearings for the environmental review and permitting processes.

**2011 – 2014: Thor Lake Rare Earth Element Project, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of the environmental assessment materials for the project. Prepared presentation materials for and participated in technical sessions and public hearings for the environmental review and permitting processes.

**2012 – 2015: Ajax Mine, Lower Nicola Indian Band, Merritt, B.C.**

- As an Environmental Specialist, provided technical support on the review of materials for this potential lead-zinc mine in the Northwest Territories.

**2012 – 2013: Decar Nickel Project, Caracle Creek International Consulting, Fort St. James, B.C.**

- As Discipline Manager, assisted client with baseline surveys for wildlife components. Specific surveys were conducted for ungulates, carnivores, birds and amphibians.

**2011 – 2012: Pine Point Project, Deninu Kue First Nation, Fort Resolution, N.W.T.**

- As an Environmental Specialist, provided technical support on the review of the water license renewal application for the project. Prepared presentation materials for and participated in public hearings.

**2011: Harper Creek Project, Yellowhead Mining Inc., Vavenby, B.C.**

- As Project Biologist, conducted snow track surveys within the proposed development area of the project. Duties included the completion of field surveys, data analysis and reporting of results.

**2005 – 2007: Prosperity Copper Gold Project, Taseko Mines, Williams Lake, B.C.**

- As Discipline Manager, conducted the effects assessments on avifauna and amphibian species for a copper gold mine in the Chilcotin region of British Columbia. Project components included the mine/mill site, 10 km access road, plus a 125 km transmission line. Assessment was completed under CEAA/BCEAA.

**2002: Diavik Diamond Mine, Lac de Gras, N.W.T.**

- As the Supervising Biologist, participated in the fish salvage within the A418 dike during the construction phase of the project.

**2003: Gahcho Kue Mining Project, DeBeers Exploration Inc, Kennedy Lake, N.W.T.**

- As Project Biologist, conducted helicopter surveys of caribou to monitor distribution, movement, and home ranges in the Gahcho Kue (Kennedy Lake) area of the Northwest Territories.

**2003: Giant Mine Remediation Project, Indian and Northern Affairs, Yellowknife, N.W.T.**

- As Project Manager, conducted muskrat utilization surveys and ecological investigations within the Baker Creek watershed on the Giant Mine surface lease area in Yellowknife, Northwest Territories.

**2003: Hope Bay/Doris North Mining Project, Kitikmeot Inuit Association, Cambridge Bay, N.W.T.**

- As Project Biologist, participated in the environmental assessment review of the Hope Bay/Doris North project on behalf of the Kitikmeot Inuit Association. Attention was focused on concerns and issues regarding barren-ground caribou, wolverines, grizzly bears, and nesting raptors.

**2004: Mary River Iron Ore Deposit, BHP Billiton, Yellowknife, N.W.T.**

- As Project Biologist, conducted a desktop biophysical assessment of the project site and region to identify potential issues of concern related to wildlife and terrestrial resources.

**Wildlife Inventories and Monitoring**

**2009 – 2012: Avian Radar Surveys, Chetwynd, B.C.**

- As Project Biologist, implemented nocturnal avian radar surveys during the spring and fall migration periods.

**2011 – 2012: Validation Procedures for Habitat Models in the Oil Sands Region, Cumulative Environmental Management Association, Fort McMurray, Alta.**

- As Project Biologist, conducted the review of habitat suitability models used in environmental assessments for operating projects in the oil sands region. Provided advice on best available models and data collection protocols to be used in validation procedures.

**1996 – 2003: Wolverine Abundance in the Central Barrens, Resource, Wildlife and Economic Development, N.W.T.**

- As Field Biologist conducting radio telemetry of wolverine and hair snagging for DNA analysis in the arctic.

**2001: Four-toed Salamander Surveys, Atlantic Canada Conservation Data Centre, Sackville, N.B.**

- As Field Coordinator, performed species searches for the Four-toed Salamander in southern New Brunswick. The Four-toed Salamander is ranked S1 (extremely rare) in the province.

**2001: Freshwater Mussel Surveys, Atlantic Canada Conservation Data Centre, Sackville, N.B.**

- As Field Project Manager, performed freshwater mussel inventories on parts of the Lower Saint John River system and the St. Croix River in southern New Brunswick.

**1996 – 1997: Spatial Organization of a Lynx Population, Department of Renewable Resources, N.W.T.**

- As Field Biologist responsible for capture, radio telemetry and analysis of a lynx population in the arctic.

**1998 – 2000: North American Breeding Bird Survey, New Brunswick and Northwest Territories, Yellowknife, N.W.T.**

- As Route Leader, conducted and participated in breeding bird surveys in New Brunswick and the Northwest Territories.

**1997: Bathurst Caribou Response to Fencing, Lupin Mine, N.W.T.**

- As Field Biologist, observed behaviour of barren-ground caribou in response to the presence of fencing and plastic deflectors.

**1997: Ancient Murrelet Monitoring, Laskeek Bay Conservation Society, B.C.**

- As a member of the field crew responsible for monitoring Ancient Murrelet nests and other seabirds on the Queen Charlotte Islands, British Columbia.

**1996: Arctic Geese Nest Success, Resource, Wildlife and Economic Development, N.W.T.**

- As Field Biologist conducting surveys of nesting behaviour for Canada Geese and Greater White-fronted Geese at the Walker Bay Field Station on the Kent Peninsula south of Cambridge Bay, N.W.T.

**1996: Shorebird Nesting Surveys, Canadian Wildlife Service, Creswell Bay, Nunavut**

- As Field Biologist conducting shorebird nesting surveys at Creswell Bay on Somerset Island south of Resolute, N.W.T.

**1988 – 1993: Ecological Monitoring, City of Moncton, Moncton, N.B.**

- As Field Project Manager responsible for conducting muskrat, bird, nest, small mammal and vegetation inventories in salt-water marsh ecosystems along the Peticodiac River in Moncton, New Brunswick.

**1990 – 1992: Eider Nest Success Surveys, Department of Natural Resources, Sheet Harbour, N.S.**

- As part of the field crew, conducted Common Eider nest success surveys and Double-crested Cormorant surveys on coastal islands off Nova Scotia.
- Conducted helicopter surveys for waterfowl broods in coastal Nova Scotia.

**1992: Leach's Storm Petrel Monitoring, Department of Natural Resources, Bon Portage Island, N.S.**

- As Field Biologist, participated in the mist netting and banding on Leach's Storm Petrels.

**Ecological Assessments**

**2002: Watershed Delineation, Deh Cho Land Use Planning Committee, Yellowknife, N.W.T.**

- As Project Manager for a pilot project to determine the feasibility of developing digital mapping of watersheds in the Deh Cho territory at a 1:250,000 scale using geographic information systems (GIS) to develop a watershed-mapping model and process.

**2001: Landscape Analysis of Priority Sites for Field Investigation, Maine Natural Areas Program, Sackville, N.B.**

- As Project Manager, conducted landscape analysis for potential sites that could support rare species and natural communities near the Maine-New Brunswick border using GIS. Prepared composite maps and a report.

**1998 – 1999: Nunavut General Monitoring Program, Indian and Northern Affairs Canada, Yellowknife, N.W.T.**

- As Project Manager responsible for initiating and coordinating Nunavut General Monitoring Program which identifies changes in the long-term state and health of the Nunavut Settlement Area. The monitoring program acts as an 'early-warning' system for changes in the environment.

**1997: Tundra Ecosystem Research Station, Daring Lake, N.W.T.**

- As Camp Manager, provided assistance with the International Tundra Experiment (ITEX), wolverine and wolf monitoring, and the Tundra Science Camp for high school students.

**1992: Delineation of Old Growth Forests, Department of Natural Resources Nova Scotia Windsor, N.S.**

- As Project Leader responsible for delineating areas of old growth forests in Hants County, Nova Scotia, using forest stand maps, aerial photographs, helicopter surveys and ground-truthing.

**Data and Information Management and Reporting**

**2003: Species at Risk Information, Enbridge Pipelines, Edmonton, Alta.**

- As a British Columbia Coordinator responsible for compilation and reporting on species at risk data and information for a pipeline company in northern and western Canada.

**2002: Coordination of Environmental Assessment Review Process, Indian and Northern Affairs Canada, Yellowknife, N.W.T.**

- As Project Manager responsible for updating regulatory framework for the Mackenzie Valley Resources Management Area with respect to a potential mineral development in the North Slave Region of the Northwest Territories.

**1999 – 2002: Compilation of Biodiversity Information, Atlantic Canada Conservation Data Systems, Sackville, N.B.**

- As Assistant Data Manager, compiled georeferenced occurrence records for rare and uncommon faunal species throughout Atlantic Canada. Prepared reports on the biodiversity information for Atlantic Canada.

**1999 – 2002: General Status of Wildlife Species, Atlantic Canada Conservation Data Centre, Sackville, N.B.**

- As Assistant Zoologist, assisted with the development of status ranks for faunal species for five jurisdictions in Atlantic Canada.

**1999 – 2002: Database Requirements for Species at Risk, Atlantic Canada Conservation Data Centre, Sackville, N.B.**

- As Assistant Zoologist, managed relational and spatial databases for rare and uncommon species in Atlantic Canada.

**1996: Document Preparation, West Kitikmeot/Slave Study Society, Yellowknife, N.W.T.**

- As Environmental Coordinator, drafted and revised policy documents and guidelines for the West Kitikmeot/Slave Study Society.

**1995: Waterfowl Spring Harvest in the Mackenzie Delta, Department of Renewable Resources NWT, Yellowknife, N.W.T.**

- As Project Biologist, conducted quantitative data analysis and report preparation on information collected from the waterfowl spring harvest in the Mackenzie Delta, Northwest Territories from 1992 – 1994.

**EMPLOYMENT HISTORY**

**2011 – present: Senior Wildlife Biologist, LGL Limited environmental research associates, Sidney, B.C.**

- Project management including: client liaison, staff management, budget management, report preparation and delivery.

- Providing senior support on projects in the N.W.T., Alberta, B.C., Ontario and Alaska.
- Conducting field studies and related project operations in various locations throughout Canada and the U.S.A.

**2011: Senior Wildlife Biologist, Dillon Consulting, Richmond, B.C.**

- Project Manager, Senior Wildlife Biologist
- Program Coordinator for a biophysical assessment, covering vegetated communities, wetlands and wildlife habitat, for a six quarter section site in southern Alberta.
- Conducted winter wildlife ground-based surveys in the Thompson-Okanagan region of British Columbia.
- Conducted reconnaissance level surveys for western painted turtle in the Shuswap region of British Columbia.

**2004 – 2011: Senior Wildlife Biologist, Stantec Consulting, Burnaby, B.C.**

- Group Leader, Senior Wildlife Biologist and Project Manager in charge of a team of up to 13 wildlife biologists and vegetation ecologists.
- Co-authored and senior reviewed several technical reports related to the environment effects of project development on wildlife, biodiversity and terrestrial resources.
- Managed small to large environmental assessment projects within the mining, oil and gas, and wind energy sectors.
- Specialized in modeling wildlife habitat suitability for various species (woodland caribou, moose, mule deer, black bear, grizzly bear, American marten, Marbled Murrelet, Northern Goshawk, song bird communities) in several regions of British Columbia.

**2002 – 2004: Wildlife Biologist, Jacques Whitford Limited, Yellowknife, N.W.T.**

- Managed and participated in several wildlife monitoring surveys including ecological investigations at the Giant Mine, baseline surveys of barren-ground caribou, and the collection of wolverine DNA samples in the central barrenlands of the Northwest Territories.
- Managed and conducted bird hazard risk assessments for two remote community airports (Gameti and Deline, Northwest Territories).

**1999 – 2002: Assistant Zoologist / Assistant Data Manager, Atlantic Canada Conservation Data Center, Sackville, N.B.**

- Managed data related to species of conservation concern in Atlantic Canada and contributed to general status ranks for all species.
- Conducted research on the distribution of freshwater mussels in the Lower Saint John River system and the St. Croix River, and the presence of the endangered four-toed salamander in southern New Brunswick.
- Completed a landscape analysis for potential sites that could support rare species and natural communities near the Maine-New Brunswick border using GIS; prepared composite maps and a report.

**1998 – 1999: Environmental Scientist, Indian and Northern Affairs Canada, Yellowknife, N.W.T.**

- Designed and implemented a general monitoring program for Nunavut Territory and participated in land use planning workshops for several regions on Nunavut.
- Provided guidance and input into the Cumulative Impact Monitoring Program for the Mackenzie Valley.

**1995 – 1997: Wildlife Technician, Department of Resources, Wildlife and Economic Development, Yellowknife, N.W.T.**

- Participated in nesting success surveys of Canada Geese and Greater White-fronted Geese on the Kent Peninsula. Completed data analyses on nest timing and success ratios using ANOVA, regression and logistic regression.
- Completed data analysis and report writing on the waterfowl spring harvest for the Mackenzie Delta.
- Conducted research on lynx home ranges in the Mackenzie Bison Sanctuary. Field data techniques included: capture of lynx, attaching radio transmitters, using ground and aerial radio telemetry, re-sighting marked individuals, measuring spatial habitat usage.
- Conducted research on wolverine home ranges and abundance in the central barrenlands of the Northwest Territories. Field data techniques included: ground and aerial radio telemetry, re-sighting marked individuals, measuring spatial habitat usage, collection of hair samples for DNA analysis.
- Completed post-mortem necropsies on harvested lynx and marten to provide information on the general health of animals.

**1992 – 1994: Wildlife Technician, Seasonal, Department of Natural Resources, Waverly, N.S.**

- Conducted surveys on nesting success of Common Eiders along the eastern shore of Nova Scotia.
- Delineated areas of old growth forests in Hants County, Nova Scotia, using forest stand maps, aerial photographs, helicopter surveys and ground-truthing.
- Completed shoreline aerial surveys for waterfowl broods along the eastern shore of Nova Scotia.
- Banded Leach's Storm Petrels on Bon Portage Island.

**1988 – 1993: Wildlife Biologist, Seasonal, Greater Moncton Pest Control Commission, Moncton, N.B.**

- Collected data on muskrat populations and bird nesting habits in wetlands in the Greater Moncton area.
- Supervised summer staff involved in the mosquito control program.

**TEACHING EXPERIENCE**

2008, 2009	Seabird Survey Trainer, Kavik-AXYS Ltd, Inuvik, N.W.T.
1995 – 1999	Natural History Interpreter, Ecology North, Yellowknife, N.W.T., 1995 – 1999
1991	Natural History Interpreter, Nova Scotia Museum of Natural History, Halifax, N.S.
1989	Teaching Assistant, Biology Department, Acadia University, Wolfville, N.S.

## RESEARCH EXPERIENCE

### **2009 – present: Ph.D. Candidate, Natural Resources and Environmental Studies, University of Northern British Columbia, Prince George, B.C.**

- The goal of my research is to measure movement patterns and habitat use by birds in relation to wind energy developments through meeting the following objectives:
  - To develop affordable high performance Radar Tracking Systems – to test digitization software being used to capture data from small marine radars during periods of high intensity bird movement and plot the trajectories of individual targets. A repeatability analysis will be used to measure the error of the data captured by the software compared to manually recorded data.
  - To understand/predict bird movements at wind farm sites in British Columbia. Data is collected from baseline and monitoring studies from to investigate how factors such as ridge elevation, year, season, average temperature and wind or weather patterns affect passage rates of migrating birds. The influence of these variables on bird movements will be analyzed using logistic regression.
  - To assess avoidance behavior of birds in relation to wind turbines – marine radar units are used to monitor the proximity of flight paths to individual turbines and whether these individual tracks end at turbines (potential collisions) or avoid turbines during the migration periods. Avoidance behaviour is assessed during various weather conditions to determine if weather conditions affect the bird's ability to visually detect and avoid turbines.

### **2002 – 2004: Masters Student, Department of Environment and Sustainability, Royal Roads University, Victoria, B.C.**

- Investigated how cumulative effects on wildlife and wildlife habitat are being addressed on various projects in the Northwest Territories.
- Collaborated with the federal government to apply a science-based approach for the management of cumulative effects.

### **1989: Undergraduate Student, Biology Department, Acadia University, Wolfville, N.S.**

- Spatial utilization of Red Squirrels (*Tamiasciurus hudsonicus*) in fall and winter – investigated the variation in seasonal home range use in response to weather variables (e.g., temperature, precipitation).
- Field data techniques included: capture of Red Squirrels, attaching radio transmitters and colored collars, using radio telemetry, re-sighting marked individuals, measuring spatial habitat usage.

## TECHNICAL REPORTS AND PUBLICATIONS

Otter, K.A., M.I. Hartley, M. d'Entremont, N.N. Johnston, D. Walsh, J. Bradley, M. Willie and A.C. Pomeroy. 2014. Avian movement at the Dokie I Wind Energy Project 2008-2012: analysis of potential conflict between wind development and avian migration in the northern Rocky Mountains. Natural Resources & Environmental Studies Institute (NRESi) Technical Report #1. University of Northern British Columbia, Prince George, B.C., Canada.

d'Entremont, M.V. 2014. The presence of muskrats (*Ondatra zibethicus*) in a highly contaminated watershed near Yellowknife, Northwest Territories. Northwestern Naturalist (in press).

- d'Entremont, M.V., K.A. Otter, and I. Hartley. 2014. Analytical protocols for the detection and auto-extraction of aerial vertebrate targets from digital radar signals at a wind energy project. <http://www.unbc.ca/ken-otter/avian-movement>.
- Zimmerling, J.R., A. Pomeroy, M.V. d'Entremont, and C.M. Francis. 2013. Canadian estimate of bird mortality due to collision and direct habitat loss associated with wind turbine development. *Avian Conservation and Ecology*. *Avian Conservation and Ecology* 8(2):10. <http://dx.doi.org/10.5751/ACE-00609-080210>
- Muir, J.E., M. d'Entremont, J. Gatten, L. Ainsworth, and D. Robichaud. 2012. Validation procedures for habitat models in the Oil Sands Region. LGL Report EA3354. Unpublished report for the Cumulative Environmental Management Association (CEMA) – The Reclamation Working Group (RWG), Fort McMurray, Alta., by LGL Limited, Sidney, B.C. 89 pp + Appendices.
- d'Entremont, M. 2008. Noteworthy spring concentrations of Surf Scoters on the north mainland coast of British Columbia. *Wildlife Afield*. 4(2):280–282.
- Pomeroy, A.C., J. Preston, N. Johnston, C. Bryden, M. d'Entremont, and K.A. Otter. 2008. Wildlife monitoring report for Dokie and Wartenbe Wind Energy projects. Report prepared for EarthFirst Energy Ltd.
- Pomeroy, A.C., P. Thomas, C. Morcos, A. Labrosse, J. Preston, C. Bryden, M. d'Entremont, and K.A. Otter. 2007. Wildlife monitoring report for Dokie and Wartenbe Wind Energy projects. Report prepared for EarthFirst Energy Ltd.
- d'Entremont, M.V. 2004. Guidance for addressing the cumulative effects assessment on wildlife and wildlife habitat from pipeline developments in the NWT. M.Sc. thesis, Royal Roads University, Victoria, B.C. 50 pp.
- d'Entremont, M.V. 2002. Priority sites for field biology investigations: a landscape analysis of the Aroostook hills and lowlands on the New Brunswick side of the Canada – USA Border. Atlantic Canada Conservation Data Centre, Sackville, N.B. 28 pp.
- Bredin, K., S. Blaney, M. d'Entremont, S. Gerriets, and C. Spicer. 2001. Biodiversity Conservation Data for New Brunswick, Progress of the Atlantic Canada Conservation Data Centre October 1997 – March 2001. Atlantic Canada Conservation Data Centre, Sackville, N.B. 84 pp.
- Rainer, R. and M.V. d'Entremont. 2000. Report to Dalhousie University, School for Resources and Environmental Studies for the project toward completing a protected areas network in Nova Scotia. R005-2000 Atlantic Canada Conservation Data Centre, Sackville, N.B. 12 pp.
- Bromley, R.G. and M.V. d'Entremont. 1995. Characteristics and management implications of the waterfowl spring harvest in the Mackenzie Delta, Northwest Territories, 1992–1994. GNWT Department of Renewable Resources, Yellowknife, N.W.T.

#### **PRESENTATIONS AND POSTERS**

- d'Entremont, M., K. Otter and M.I. Hartley. 2014. Nocturnal bird movements at a wind energy project in response to rain. International Society for Behavior Ecology 2014 Conference, New York, NY. (Poster)
- d'Entremont, M., K. Otter, and I. Hartley. 2012. Development of analytical protocols for bird migration data collected by radar – tools and techniques. North American Ornithological Conference, August 2012, Vancouver, B.C. (Spoken Paper)

- d'Entremont, M., K. Otter, J. Brzustowski, and S. Loots. 2011. Detection of birds by radar: correlating echo signatures to taxonomic orders. Society of Canadian Ornithologists Annual Meeting, August 2011, Moncton, N.B. (Spoken Paper)
- Pomeroy, A.C., M. d'Entremont, and C.M. Francis. 2011. Estimated impacts on birds of direct habitat loss and mortality due to collisions associated with wind turbine developments in Canada. Society of Canadian Ornithologists Annual Meeting, August 2011, Moncton, N.B. (Poster)
- d'Entremont, M.V., A.C. Pomeroy, N. Johnson, and K. Otter. 2010. How does the accuracy of data on avian movement vary with radar methodology? Wind Wildlife Research Meeting VIII, National Wind Coordinating Collaborative, Denver, Colo. (Spoken Paper)
- d'Entremont, M.V. 2008. Wildlife survey protocols for wind energy developments: dealing with regional and national issues. 24th Annual Canadian Wind Energy Association Conference. October 2008. Vancouver, B.C. (Spoken Paper)
- d'Entremont, M.V. 2007. Assessment business risk and environmental concerns through adaptive management. 23rd Annual Canadian Wind Energy Association Conference. October 2007. Québec City, Qué. (Spoken Paper)
- d'Entremont, M.V. 2006. Environmental assessment as a planning tool. 22nd Annual Canadian Wind Energy Association Conference. October 2006. Winnipeg, Man. (Spoken Paper)
- d'Entremont, M.V. 2005. Community planning and airport operations – what community planners should know. Bird Strike 2005 Conference. September 2005. Vancouver, B.C. (Spoken Paper)
- d'Entremont, M.V. and N. Lawson. 2003. Access management for seismic operations – impacts and techniques. Western and Northern Affiliate of the International Association for Impact Assessment Conference. March 6–7, 2003. Yellowknife, N.W.T. (Spoken Paper)
- Mulders, R., D. Paetkan, M. d'Entremont, R. Gau, and D. Cluff. 2003. A new approach to indexing wolverine abundance on the central barrens. GeoScience Forum, November 19–21, 2003, Yellowknife, N.W.T. (Poster)

#### **AWARDS**

- UNBC Research Project Award, 2012
- UNBC Graduate Research Award, 2009 & 2010
- Northern Scientific Training Program (AANDC), 2010
- NSERC Industrial Postgraduate Scholarship, 2009
- Stantec Technical Leadership Achievement Stipend, 2008
- Jacques Whitford Publication Stipend, 2008
- Science Horizons Internship, Atlantic Canada Conservation Data Centre, 1999

#### **AFFILIATIONS AND CONTRIBUTIONS TO THE SCIENTIFIC COMMUNITY**

- Association of Professional Biologists of Alberta, 2003 – present
- International Association of Impact Assessment, 2003 – present
- Association of Professional Biologists of British Columbia, 2005 – present
- College of Applied Biology, Audit Committee Member, 2006 – present
- Pacific Seabird Group, 2008 – present
- Society of Canadian Ornithologists, 2011 – present

- North American Breeding Bird Survey, Co-coordinator of the survey in the N.W.T., 1997 – 1999; survey participant in N.B., 2000 – 2001
- Ecology North, Director, 1995 – 1998; Treasurer, 1998

#### **PROFESSIONAL DEVELOPMENT COURSES**

- Wild Safe BC – Bear Safety Training Module, 2015
- First Aid Level 1, St. John Ambulance, 2013
- Transportation Endorsement, St. John Ambulance, 2013
- Coldwater HUET Training, 2012
- Transportation Worker Identification Credentials (TWIC), 2012
- MICA Professional Development Training, 2008
- H2S Alive, Enform, 2008
- Jacques Whitford Environmental Assessment Course, 2007
- Coaching for High Performance, MICA, 2007
- Effectiveness in Working with People, 2007
- WHMIS Training, Jacques Whitford, 2007
- ATV Safety Training, BCIT, 2004
- Project Management Course, Jacques Whitford, 2004
- Canadian Firearms Safety Course, Department of Justice Canada, 2003
- Mine Safety Supervisor Certificate Level I, WCB-NWT, 2002
- Restricted Radio Operator Certificate

Last revision: March 2015

# Elmar Plate, PhD

## Senior Fisheries Biologist, LGL Limited

### EDUCATION

- PhD, Biology. University of Victoria, 2001
- Diplom Biology (accepted as M.Sc.), Aquatic Sciences and Aquaculture. University of Hamburg, Institute of Fisheries Science and Hydrobiology, Germany, 1994
- Vordiplom Biology (accepted as B.Sc.). University of Bonn, Germany, 1992

### PROFESSIONAL EXPERIENCE

#### **2008 – present: Fisheries Biologist, LGL Limited environmental research associates, Sidney, B.C.**

- Project Manager and Co-author: Synthesis report for the re-introduction of Sockeye salmon into Allouette Reservoir for the Allouette River Management Society and the BC Hydro Fish and Wildlife Compensation Program, ongoing.
- Project Manager: Field measurements and model optimization to relate Total Gas Pressure super-saturation events to Hugh Keenleyside Dam (Mid-Columbia River) operational parameters for BC Hydro, ongoing.
- Field Project Manager and Technical Specialist: Fraser River sturgeon side-scanning sonar project to determine sturgeon spawning habitat locations and features for the Fraser River Sturgeon Conservation Society, ongoing.
- Project Manager and Lead Author: The Sliammon First Nation groundfish contamination study, ongoing.
- Project Team Member and Technical Specialist: Installation, download and maintenance of water stage meters and temperature loggers for BC Hydro in the Mid-Columbia River as a subcontract to Okanagan Nation Alliance, ongoing.
- Project Team Member and Technical Specialist: Execution of and reporting on Acoustic Doppler Current Profile measurements as part of the Wannock River salmon enumeration for the Wuikinuxv (Owikeno) First Nation in Rivers Inlet in 2012.
- Co-author and Co-project Manager: Fisheries management plan for the implementation of the fisheries section of the Sliammon Treaty as a Treaty Related Measure for the Tla'amin First Nation, ongoing.
- Project Manager: Alouette Reservoir fish capture study for DFO in 2012.
- Project Manager and Lead Author: Williston Reservoir hydroacoustic studies in response to Bennett Dam spilling 2012 for BC Hydro.
- Co-author of a review of the Environmental Impact Statement Report for the Gahcho Kue Diamond Mine planned by DeBeers Canada for the Deninu Kué First Nation in 2012.
- Team Member, Co-author and Expert Witness in public hearings: Review of the marine part of the Enbridge Northern Gateway diluted bitumen pipeline and shipping proposal for the Gitga'at First Nation from 2011 – 2013.
- Co-project Manager: The Lower Athabasca River winter ecology study for the Cumulative Environmental Management Association (CEMA) in Fort McMurray, Alberta, ongoing.
- Project Manager and Lead Author: The recovery initiative of the commercial clam fishery in the Kyuquot/Checkleset Territory for the Kyuquot-Checkleset First Nations, ongoing.

- Project Manager and Lead Author: The Sliammon First Nation Shellfish Contamination Study 2011 – 2012.
- Lead Author: Environmental Management Plan for Debris Management in the Williston Reservoir. Prepared for Chu-Cho Enterprises and BC Hydro, August 2011.
- Project Manager and Lead Author: For the Sliammon First Nation and DFO Sockeye re-introduction project into the Powell Lake as a Treaty Related Measure (2011 – 2020). This project entails the planning and coordination of a lake productivity study, a hydroacoustic study and an assessment of the Powell Lake phytoplankton, zooplankton and fish populations, ongoing.
- Project Manager and Lead Author: The 2011 Coquitlam Reservoir Hydroacoustic Study for the Bridge Coastal Restoration Program. This study is part of a multi-year salmon re-introduction project into Coquitlam Reservoir.
- Co-author (sub-contractor to Brain Olding and Associates): A review of land use planning in Secwepemcul'ecw. Prepared for the Northern Secwepemc te Quelmucw Tribal Council as the initiating document for a land use planning initiative between British Columbia and the Northern Secwepemc te Quelmucw Tribal Council, July 2011.
- Co-author (sub-contractor to Brain Olding and Associates): Mount Polley Mine Technical Assessment Report for a Proposed Discharge of Mine Effluent. Prepared for Mount Polley Mining Corporation, Soda Creek First Nation and Williams Lake First Nation, July 2011.
- Co-author: The 2011 Arrow Lakes Burbot Tracking Study for BC Hydro. This study is part of a multi-year project to study potential effects of reservoir water levels fluctuations on the general and spawning behaviour of burbot in the Arrow Lakes, ongoing.
- Project Manager and Lead Author, 2010: Hul'quimi'num AAROM Group Shellfish Beach Alienation Project. This project described shellfish beach alienation and recommended measures to counteract shellfish beach alienation and increase the opportunity of local First Nations to conduct sustenance or commercial shellfish fisheries.
- Project Manager and Lead Author, 2010 – 2011: The successful writing and coordination of a business and training plan for the establishment of a commercial fishing enterprise for the Kitsumkalum, Kitselas, Metlakatla, Gitga'at, Gitxaala and Haisla First Nations on British Columbia's North Coast. Addressing the requirements of the Pacific Integrated Commercial Fisheries Initiative (PICFI), a business plan was completed for and approved by the Department of Fisheries and Oceans.
- Project Manager and Lead Author: The 2009 – 2013 Alouette Lake Sockeye tracking study for the Bridge Coastal Restoration Program and the Alouette River Management Society. This study is part of a multi-year salmon re-introduction project into Alouette Reservoir, ongoing.
- Field Project Team Leader: The 2010 Skeena Chinook Radio-Telemetry Project with the Skeena Fisheries Commission and the Community of Kitsumkalum for the Pacific Salmon Commission. The project demonstrated the wide distribution and morphology of Chinook spawning areas throughout the Skeena Watershed and either established existing or re-established the link between the genetic and the on the ground categorization of Chinook into distinct stock groupings.
- Co-author, 2009: A review for the environmental assessment certificate for the Blue Pearl Molybdenum Mine for the Office of the Wet'suwet'en.
- Field Manager: for the five-year (2009 – 2013) Arrow Lakes Burbot Tracking Project for BC Hydro, ongoing.

- Project Team Member: The 2009, 2010 and 2011 Fraser River Fishwheel salmon enumeration, tagging and commercial harvest projects for the Pacific Salmon Commission.
- Project Manager and Lead Author, 2010: Williston Lake Debris Management Environmental Management Plan for the Tsay Keh Dene First Nation and BC Hydro.
- Project Team Member, 2011: The Lower Fraser juvenile Sturgeon project for the Fraser River Sturgeon Conservation Society, Vancouver, B.C. In this project, we tried to determine the rearing habitat for young-of-the-year White Sturgeon as the basis for the protection of their habitat from gravel removal.
- Project Manager and Lead Author: Kokanee Fisheries Management Plan for Lake Roosevelt for the Confederated Tribes of the Colville Reservation, Washington Department of Fish and Wildlife and the Spokane Tribes of Indians as part of the Lake Roosevelt Management Team, Spokane.
- Project Team Member, 2009: Early Fraser Chinook tagging project for the Fraser Salmon and Watershed Program and the Pacific Salmon Commission. In this project we tried to determine the holding areas and migration speed of the endangered early Fraser River Chinook as the basis for their protection.
- Project Team Member, 2010: Review of the environmental assessment document to obtain the EA certificate for the Morrison Copper Gold Mine for Lake Babine Nation.
- Lead Author and Project Manager, 2009: The Fraser River Port Mann Bridge-Douglas Island Eulachon Study, 2009. Prepared for Watershed Watch and Kwikwetlem First Nation. In this study, we determined the potential effect of the extension of the Port Mann Bridge on Eulachon spawning and rearing habitat as the basis for a re-newed emphasize of the dire situation of Fraser River Eulachon. Available at:  
[http://www.watershed-watch.org/publications/files/FraserEulachonReport-July15\\_2009.pdf](http://www.watershed-watch.org/publications/files/FraserEulachonReport-July15_2009.pdf)
- Project Manager and Lead Author, 2009: Discussion paper: data gaps and research recommendations for Lake Roosevelt Kokanee as the basis of a wild stock recovery plan as part of the Chief Joseph Kokanee, Enhancement Project for the Confederated Tribes of the Colville Reservation.
- Project Manager and Lead Author, 2009: Best Practices for First Nation involvement in environmental reviews of development projects in British Columbia. Prepared for the New Relationship Trust. In this much acknowledged report, we laid out suggestions for a road map for better collaboration of First Nations Governments, Industry and Federal and Provincial Governments within the Environmental Assessment Process. Available at:  
<http://www.newrelationshiptrust.ca/downloads/environmental-assessments-report.pdf>
- Co-author, 2008: A review for the environmental assessment document for the Blue Pearl Molybdenum Mine for the Office of the Wet'suwet'en.
- Project Manager and Lead Author: Skeena Chinook Tagging Feasibility Study for the Pacific Salmon Commission, 2008. In this study we determined whether it was feasible to carry out a complete radio-telemetry study on Chinook in the Skeena Watershed. The follow-up study was carried out in 2010.
- Lead Author: Responsible fishing in the B.C. fishery (2009). Prepared for the Pacific Fisheries Resource Conservation Council. In this study we outlined how the fishery on our coast could be conducted in a more sustainable and value added way to allow for commercial fisheries into the future. Available at:  
[http://www.fish.bc.ca/files/ResponsibleFishingBCSalmonFishery\\_2009\\_03\\_Complete.pdf](http://www.fish.bc.ca/files/ResponsibleFishingBCSalmonFishery_2009_03_Complete.pdf)

- Co-author: Professional opinion on the impact of coal bed methane extraction on salmon and salmon habitat (2008) for the Pembina Institute.

**2003 – 2007: Independent Consultant (FiEdCo Consulting) and Instructor, North West Community College (NWCC), Prince Rupert, B.C.**

- Instructor of the following courses:
  - Proposal Writing and Project Planning (Applied Coastal Ecology (ACE) Program):
    - Students, in the three years that the class was taught, successfully applied for a combined total of more than \$100,000 that benefited local community and fisheries projects.
  - Salmon ID, Hatchery Techniques and newest Research (ACE)
  - Fisheries Management and Regulations (ACE)
  - Coastal Wildlife Management (ACE)
  - People and the Environment (University Credit)
  - Introduction to Mariculture Technology (ACE)
  - Mariculture Projects Course (ACE)
  - Shellfish Aquaculture (First Nations Shellfish Aquaculture Training and ACE)
  - Traditional Ecological Knowledge, only coordinator. Course taught by First Nations (ACE)
  - Solid Waste Management (ACE)
  - Drinking Water Treatment (ACE)
  - Shellfish ID (ACE)
  - Ground Fish ID (ACE)
  - Seafood Processing (ACE)
  - Introduction to Physical, Chemical and Geological Oceanography (2nd Year University Credit)
  - Ichthyology (2nd Year University Credit)
  - Environmental Impact Assessment (ACE)
  - Introduction to Biological Oceanography (2nd Year University Credit)
  - Vertebrate Zoology (2nd Year University Credit)

**2007: Independent Consultant, Selected Consulting Contracts**

- Fisheries and zooplankton assessment of two remote lakes on the B.C. north coast for potential re-introduction of Sockeye Salmon, Client: Gitga'at Development Corporation, Hartley Bay, B.C. Contact person: Chris Picard (250-624-5703); Collaborators: DFO Stock Assessment Branch (Prince Rupert Office) and BC Ministry of Sustainable Resource Management (Smithers Office).
- Environmental assessment project in the community of Metlakatla. Contact person: Patricia Siliieff (250-628-3234); Collaborators: Environmental Health Office, Prince Rupert.

**2006 Feb – Mar**

- Proposal to investigate the fish assemblages in seagrass and seaweed habitats on the B.C. North Coast. Contact person: Clyde Smith, Metlakatla Fisheries (250-635-6177).

**2005 Nov – 2006 Jan**

- The port-harbours chapter of the background report for the integrated marine use planning process of the Pacific North Coast Integrated Management Area for Department of Fisheries and Oceans PNCIMA office. Contact person: Joy Hillier (250-627-3449).

**2004 – 2005**

- Coordination of a drinking water study to gain a better understanding of the interactions between drinking water and food quality on one side and human health in First Nations communities on the other. Client: Federal Ministry of Health, Guelph, Ont. Contact person: Dr. Victoria Edge (519-826-2272).

**2005 May**

- Taught a three day proposal writing and project management course that was well received within the community and led to the initiation of several projects

**2004 – 2005**

- Single author: Development options for the Coastal Integrated Resource Management (CIRM) program at the Northwest Community College and the planning and implementation of a shellfish aquaculture training program catering to the Northcoast Shellfish Aquaculture Initiative.

**2005**

- Presented and promoted college programs as a public relations manager in the First Nations communities close to Prince Rupert on the North Coast of British Columbia.

**2004 – 2005**

- Consultant for the Haisla Fisheries Organization with regards to successful fund raising, project planning and execution of their shellfish aquaculture development initiative.

**2003**

- Development of a curriculum for the standardization of field methods by First Nations fisheries technicians in the Skeena area. The first course was organized and taught in November 2003.

**2001 – 2003**

- Writing of successful grant proposals for the Skeena Fisheries Commission and planning and execution of fisheries field work for Wet'suwet'en and Gitksan fisheries organizations.

**2001 – 2003: Fisheries Biologist, Project Manager and Instructor, Git'Ksan and Wet'Suet'En Watershed Authorities, Skeena Fisheries Commission, Hazelton, B.C.**

- Preparation of a report investigating the economic importance of the angling industry for the Skeena Region.
- Preparation of 16 funding applications submitted to funding agencies ranging from DFO Canada to the Bullitt Foundation in the U.S.A. Several proposals received funding in 2002 and 2003.
- Field Coordinator of fisheries projects. Background research for economic development projects based on the value added processing of selectively caught salmon species.
- Preparation of presentations held at several conferences and meetings.
- Publication of four peer-reviewed scientific publications and the organization of a lecture series about fisheries and fish biology.
- Preparation of a report about the fisheries biology of the Nass River as the base for the Land Treaty Negotiations between the Gitanyow First Nation, the federal and the provincial governments.

- Invited speaker on fish physiology and endocrinology at a conference in Japan.

**1994 – 2001: Independent Consultant, Git'Ksan and Wet'Suet'En Watershed Authorities, Ministry of Environment Lands and Parks, Hazelton, B.C.**

- Preparation of training materials covering the methods specified in the Ministry's Field Sampling Manual.
- Preparation of proposals for applied research projects and co-authoring of research reports to federal and provincial government agencies and other funding agencies.

**VOLUNTARY PROFESSIONAL COMMITMENTS**

**2011 – present**

- Advisory Committee Member for the Species at Risk Listing process by DFO.

**2003 – 2007**

- Acted as volunteer in pursuit of better local stewardship for our environment as a representative for the "Drinking Water" as well as the "Fish and Aquatic Habitat" sectors at the roundtable that fabricated the Land Resource Management Plan (LRMP) for the Morice Forest Region.
- Peer-reviewed and edited a scientific paper for publication (Fish Physiology and Biochemistry) and peer-reviewed for the National Sciences and Engineering Research Council (NSERC).
- Steering Committee Member for the North Coast Water Quality and Biotoxin Program Society to utilize strong professional ties to the provincial and federal fisheries agencies and all First Nations Organizations in the North Coast Region for the development of a northcoast shellfish aquaculture industry.
- Board of Directors Member for the Prince Rupert Salmonid Enhancement Society.

**VOLUNTARY COMMUNITY ACTIVITIES**

2011 – present: Victoria German School, Board of Directors Member and Fundraising Chair.

2011 – 2012: Victoria German School, Board of Directors Member and Event Volunteer.

2002 – 2003: Fish and water sector alternate on the round table of the Morice Land Resource Management Plan.

1986 – 1987: President of a foundation for the integration of financially challenged youths into organized sports.

1980s: Member of regional environmental awareness groups active in regional public relations work dealing with national and international environmental issues.

**ACCOMPLISHMENTS**

**2003:** University of Victoria, Victoria, B.C.

- Invited speaker to the 7th International Symposium on Reproductive Physiology of Fish (ISRPF), 18–23 May 2003, Mie, Japan.

**2000 – 2001:** University of Victoria, Victoria, B.C.

- Two time recipient of the Royal Bank Academic All-Canadian Honour Roll.

**1998:** University of Victoria, Victoria, B.C.

- GREAT scholarship awarded by the Science Council of British Columbia.

**1998:** University of Victoria, Victoria, B.C.

- Best Speaker's Award within the Grad Student Symposium of the Biology Department of the University of Victoria.

**1995 – 1999:** University of Victoria, Hazelton, B.C.

- Research and consulting scholarship awarded in the form of a four-year consulting contract, by the Gitksan and Wet'suwet'en Watershed Authorities.

#### **SELECTED PUBLICATIONS AND PROPOSALS**

Plate, E., M. Foy and R. Krehbiel. 2009. Best Practices for First Nation Involvement in Environmental Assessment Reviews of Development Projects in British Columbia. Report prepared for New Relationship Trust, West Vancouver, B.C., by LGL Limited and First Nations Environmental Assessment Technical Working Group. Available at: <http://www.newrelationshiptrust.ca/downloads/environmental-assessments-report.pdf>

Plate, E., R.C. Bocking, K.K. English. 2009. Responsible fishing in Canada's Pacific Region salmon fishery. Prepared for the Pacific Fisheries Resource Conservation Council. Available at: [http://www.fish.bc.ca/files/ResponsibleFishingBCSalmonFishery\\_2009\\_03\\_Complete.pdf](http://www.fish.bc.ca/files/ResponsibleFishingBCSalmonFishery_2009_03_Complete.pdf)

Plate, E.M. 2009. Discussion paper: Data gaps and research recommendations for Lake Roosevelt Kokanee as the basis of a wild stock recovery plan. Chief Joseph Kokanee, Enhancement Project. Prepared for the Confederated Tribes of the Colville Reservation, Nespelem, Wash. Contact person: Brett Nine.

Plate, E.M., K.K. English. 2008. Lower Skeena Chinook Tagging Feasibility Study 2008. LGL Report EA3068. Prepared for the Pacific Salmon Commission and Kitsumkalum Fisheries. Available at: [http://fund.psc.org/2008/Reports/NF\\_2008\\_I\\_19B\\_English.pdf](http://fund.psc.org/2008/Reports/NF_2008_I_19B_English.pdf)

Plate, E.M. 2008. An investigation of the fish populations, zooplankton communities and fish diet in Red Bluff and Batchellor Lakes in 2007. Prepared for the Gitga'at Development Corporation. Client: Pacific Salmon Commission. Available at: [http://fund.psc.org/2007/Reports/NF\\_2007\\_E\\_10\\_Picard\\_Phase%201%20Report.pdf](http://fund.psc.org/2007/Reports/NF_2007_E_10_Picard_Phase%201%20Report.pdf)

Plate, E.M. 2006. Ports chapter of the background report for the PNCIMA integrated marine use planning process. Prepared for the Department of Fisheries and Oceans, Canada.

Plate, E.M. 2005. Coastal Integrated Resource Management Program development report. Prepared for the Northwest Community College, Prince Rupert, B.C.

Plate, E.M. 2004. Skeena Region First Nations communities drinking water and Foodborne Health Project background report. Prepared for Foodborne, Waterborne & Zoonotic Infections Division, Public Health Agency of Canada, Guelph, Ont.

Plate, E.M. 2003. Advancement of the Haisla Nation's Shellfish Farming and Fisheries Program Initiatives. Successful funding proposals submitted to Coast Sustainability Trust and Nechako-Kitamaat Development Fund Society for Kitamaat Village Council, Northern B.C.

Plate, E.M. 2003. Nass River salmon management and the Gitanyow Treaty process. Prepared for the Gitanyow First Nation.

- Plate, E.M. 2003. Field work manual for a fisheries technician course in the Skeena Region.
- Plate, E.M. 2002. Sportfishing and guiding in the Skeena Watershed: economic value, demographics, and future opportunities. Prepared for the Skeena Fisheries Commission.
- Plate, E.M. 2001. Olfactory imprinting in Sockeye Salmon. PhD dissertation, University of Victoria, Victoria, B.C.
- Plate, E.M. 1994. A comparative study of the reproductive success of Rainbow and Brown Trout. M.Sc. (Diplom) thesis, University of Hamburg, Institute of Fisheries Science and Hydrobiology, Germany.

#### SELECTED SCIENTIFIC PEER-REVIEWED PUBLICATIONS AND PRESENTATIONS

- Temple, S.E., E.M. Plate, S. Ramsden, T.J. Haimberger, W.-M. Roth, and C.W. Hawryshyn. 2005. Seasonal cycle in vitamin A1/A2-based visual pigment composition during the life history of Coho Salmon (*Oncorhynchus kisutch*). *Journal of Comparative Physiology A* 192(3):301–313.
- Plate, E.M., C.C. Wood and C.W. Hawryshyn. 2003. GnRH affects activity and jumping frequency in adult Sockeye Salmon, *Oncorhynchus nerka*. *Fish Physiology and Biochemistry* 28:245–248
- Plate, E.M., B.A. Adams, W.E. Allison, G. Martens, C.W. Hawryshyn, and J.G. Eales. 2002. The effects of thyroxine or a GnRH analogue on thyroid hormone deiodination in the olfactory epithelium and retina of Rainbow Trout, *Oncorhynchus mykiss*, and Sockeye Salmon, *O. nerka*. *General and Comparative Endocrinology* 127(1):59–65.
- Plate, E.M., C.C. Wood, and C.W. Hawryshyn. 2002. No place smells like home when you are in the mood: roles of thyroid and gonadotropin-releasing hormones in olfactory imprinting in Sockeye Salmon (*Oncorhynchus nerka*). Contributed paper to the Canadian Conference for Fisheries Research, Vancouver, B.C.
- Plate, E.M. 2001. Olfactory imprinting in Sockeye Salmon. PhD thesis, University of Victoria.
- Plate, E and C.W. Hawryshyn. 1999. Hormonal Influence on imprinting in Sockeye Salmon. Paper contributed to Aquaculture Canada Conference, Victoria, B.C.
- Plate, E. and C.W. Hawryshyn. 1998. Chemoreception in Sockeye Salmon. Paper contributed to the 5th International Congress of Neuroethology, San Diego, Calif.

Last revision: 12 July 2013