



Education

*Post-Doctoral Fellowship,
Alberta Co-operative
Conservation Research
Unit, Edmonton, AB, 2006*

*PhD Environmental Biology
& Ecology, University of
Alberta, Edmonton, AB,
2005*

*MSc Biology, University of
New Brunswick,
Fredericton, NB, 2000*

*BSc Zoology, University of
Guelph, Guelph, ON, 1996*

Languages

English – Fluent

Golder Associates Ltd. – Edmonton

Career Summary

Cam is a senior consultant and Aquatic Biologist with Golder's Aquatic Division in Edmonton. His education includes a PhD in Environmental Biology and Ecology received from the University of Alberta (2005). Shortly after graduating Cam began consulting on environmental issues as a technical lead for mining projects in the North. His expertise lies in environmental impact assessments, monitoring programs, and applied research related to permitting requirements for both proposed and operating developments. He is committed to innovative, client-focused solutions that meet project schedules and regulatory expectations. He is also committed to advancing his discipline through presentations and papers for scientific and non-scientific audiences. At Golder, Cam is provided with the best available technology and resources to excel as a practitioner in the aquatic sciences.

Employment History

**Alberta Cooperative Conservation Research Unit – Edmonton, AB
Research Associate (2005 to 2006)**

As a post-doctoral fellow, Cam was the lead researcher of a team of biologists from the Alberta Conservation Association, Alberta Sustainable Resource Development, and the University of Alberta. Cam's primary objective was to conduct a pilot study near Three Hills, Alberta to assess whether an effective fish-based monitoring tool could be developed to characterize the ecological condition of small streams in the grassland ecoregion. This work has been published in the Alberta Conservation Association report series, and has been presented many times to various stakeholders and agencies throughout Alberta.

**University of Alberta – Edmonton, AB
Graduate Student (2000 to 2005)**

Cam's research focus was on aquatic ecology, conservation biology, and population dynamics. He performed a large-scale field study of the status of amphibians in the boreal foothills. He also conducted a mesocosm experiment of the physiochemical factors affecting tadpole performance in beaver ponds. His research was funded by grants received from the National Sciences and Engineering Research Council, Alberta Conservation Association, Canadian Circumpolar Institute, Mountain Equipment Co-op, and Alberta Government. The work resulted in numerous publications, research awards and media coverage.

**University of New Brunswick – Fredericton, NB
Graduate Student (1998 to 2000)**

Cam studied the benefits of wetland restoration on wildlife in Prince Edward Island. Cam monitored waterfowl pairs and broods, and the abundance of breeding anurans. Field data was combined with a spatial analysis in a GIS platform to understand local and landscape influences. His research was funded by Ducks Unlimited Canada and the Government of Prince Edward Island. Through numerous publications and presentations, the results of his research informed the conservation and management of wetlands in eastern Canada.



PROJECT EXPERIENCE – ENVIRONMENTAL MANAGEMENT

Lynx Project Offsetting Plan
NWT, Canada

Cam was the technical lead for the development of a fisheries productivity offsetting plan for a new diamond mine in the NWT. Baseline studies were performed in summer 2014 and 2015, and the plan was submitted with the application for an Authorization from DFO in spring 2015. The plan, which was approved by Fisheries and Oceans Canada, demonstrated substantial gains in productivity with the application of a community-based offsetting option. A novel element of the work was the continued partnership with the local community of Lutsel K'e to restore a local fishery in decline. Golder Project #1419746.

Back River Project Offsetting Plan
Nunavut, Canada

Cam was the project manager and technical lead for the development of a fish offsetting plan for a new gold mine development in Nunavut. The work was conducted under the recently revised Fisheries Act for an authorization for development under Section 35. Baseline studies of the Arctic Char run at Bernard Harbour were performed in 2013. The detailed offsetting plan was submitted in 2015. A key part of the plan was the application of Golder's "Bernard Harbour Study" as the offsetting option to counterbalance losses incurred at the mine site. A novel element of the work was the continued partnership with the local community, the Hunters and Trappers Organization in Kugluktuk. The offsetting plan can be located with the Back River Final Environmental Impact Statement at www.nirb.ca. Golder Project #1419666.

PROJECT EXPERIENCE – ENVIRONMENTAL ASSESSMENT

Jay Project
NWT, Canada

Cam was the technical lead for the fish and fish habitat assessment for a new diamond mine development in the NWT. Baseline studies were performed in 2013 and 2014, and the Developers Assessment Report (DAR) was submitted in fall 2014. Cam's work assessed incremental and cumulative effects to fish and fish habitat in accordance with the Mackenzie Valley Environmental Impact Review Board. Cam played a key role in the hearings for the Project, which is under final review. The DAR can be downloaded at www.reviewboard.ca. Golder Project #1419751.

Izok Corridor Project
Nunavut, Canada

Cam led a baseline assessment of fish and fish habitat in preparation of an environmental impact statement for a new mining development in Nunavut, Canada. The project included a hydroacoustic study of fisheries and lake substrate for a small Arctic lake. The assessment provided an accounting of habitat losses to be incurred by proposed mining activities. Golder Project #12-1373-0020.

Meliadine Project
Nunavut, Canada

Cam was the component lead for fish and fish habitat in the Environmental Impact Statement (EIS) for a new gold mine near Rankin Inlet, Nunavut. The work assessed incremental and cumulative impacts in accordance with the terms of the Nunavut Impact Review Board. The project certificate was issued by the board in 2014; the final EIS can be downloaded at www.nirb.ca. Golder Project # 10-1373-0076.



NICO Project
NWT, Canada

Cam was the technical lead for the fish and wildlife components of a Developer's Assessment Report for a new gold mine in the Northwest Territories. Cam provided a scientifically defensible assessment of anticipated cumulative impacts. Part of the assessment included the development and application of a winter resource selection function for barren-ground caribou. The environmental assessment exceeded the Terms of Reference prepared by the Mackenzie Valley Environment Impact Review Board. The assessment can be downloaded at www.reviewboard.ca. Cam was a key witness for the client as part of a successful hearing for the assessment. Golder Project # 09-1373-1004.

Gahcho Kue Project
NWT, Canada

Cam was the component lead for the wildlife sections of an environmental impact statement (EIS) for a new diamond mine in the Northwest Territories (NWT). Cam's role was to deliver a defensible assessment of cumulative impacts to barren-ground caribou and carnivores that exceeded the Terms of Reference put forward by the Mackenzie Valley Environmental Impact Review Board. The EIS was subject to independent review of the highest level required for a development by the Review Board in NWT. The work was a culmination of multiple years of baseline data collection and assessment analyses. The EIS team, of which Cam was a part of, was selected for a President's Award within Golder Associates Canada Ltd. The EIS can be downloaded at www.reviewboard.ca. Cam was a key witness for the client as part of a successful hearing for the environmental assessment. Golder Project # 11-1365-0012

Legacy Project
Saskatchewan, Canada

Cam was a technical lead for an environmental impact statement (EIS) for a new potash mine for Potash One in southern Saskatchewan. Cam's primary roles were to oversee reporting phases and to ensure that the biodiversity section met the Terms of Reference of the Saskatchewan Ministry of the Environment. Cam also led the habitat modelling components, such as habitat suitability indices and resource selection functions, for a suite of species of conservation concern. The project was selected for a President's Award within Golder Associates Canada Ltd. The EIS can be viewed at www.environment.gov.sk.ca. Golder Project # 08-1362-0493.

Petaquilla Project
Colon, Panama

Cam was the aquatic resources technical lead for baseline studies for a new copper mine development in a remote tropical forest ecosystem. The work was prepared according to International Finance Corporation performance standards and was consistent with Panamanian environmental law. Data was collected on a diversity of fish and macroinvertebrate species in stream sections representing various distances to the coast. Golder Project # 07-1334-0018.

Back River Project
Nunavut, Canada

Cam was the project manager and aquatic resources lead for a baseline study for a new gold mine for Dundee Precious Metals in the Central Canadian Arctic. The work met federal and territorial regulatory requirements for a future application to license the mine. Components of the work included collections of environmental and fisheries data in a small Arctic lake in the study region. The overall goal was to generate a rigorous ecological database for a future environmental impact statement. Golder Project # 06-1373-045



PROJECT EXPERIENCE – APPLIED RESEARCH & MONITORING

Bernard Harbour Arctic Char
Nunavut, Canada

Cam was the project manager and lead researcher for an environmental stewardship - education outreach program with the goal of maintaining the persistence of a self-sustaining population of Arctic char in Nulahugyak Creek (Bernard Harbour). The project, administered by the local Hunting and Trapping Organization, was funded by multiple jurisdictions and agencies. The project engaged local youth from the community of Kugluktuk who actively participated in restoring stream connections in a small stream flowing into Bernard Harbour. The study was presented with an award from the Consulting Engineers of Alberta, and is being prepared for submission to a peer-reviewed journal. Golder Project # 10-1373-0075.

Caribou Habitat Mapping for Cliffs Chromite Project
Ontario, Canada

Cam was the component lead for a study titled "Resource Selection Functions (RSFs) for Forest-Dwelling Woodland Caribou in the Far North of Ontario". The primary objective was to use satellite collar data for developing season-specific RSF models that reliably predict preferred habitats (and distributions) for forest-dwelling woodland caribou in northern Ontario. A secondary objective was to better understand habitat requirements for the persistence of self-sustaining populations for the forest-dwelling ecotype. The final report was submitted to the Ontario Woodland Caribou Resource Selection Function Working Group in September 2012. Golder Project # 10-1118-0015.

Hydroacoustic Assessment of Habitat Compensation
Alberta, Canada

Cam was the component lead for a hydroacoustic assessment of fisheries in Horizon Lake, Alberta. Biosonics echosounders were deployed along transects. Data were evaluated in Echoview using a Fish Tracking module, combined with Love's target strength equation. The work was part of a habitat compensation plan for an oil sands mine in northern Alberta. Golder Project #13-1337-0006.

Hydroacoustic Fisheries Assessment of a Small Arctic Lake
NWT, Canada

Cam was the component lead for a hydroacoustic assessment of fisheries in Kennady Lake, NWT. BioSonics echosounders (side and down-looking) were deployed along transects, representing a pre-determined level of coverage to meet reliability expectations. Data were evaluated using integration methods, target strength equations were applied, and results were linked to gill netting catch data. The work was part of a baseline study for an environmental impact statement. The study can be downloaded at www.reviewboard.ca. Golder Project # 09-1365-1004.

Effects of Water Quality on Amphibians in Beaver Creek
Alberta, Canada

Cam was the lead researcher in a study of amphibians in Beaver Creek, Alberta, downstream of Mildred Lake. The study had three components: field surveys of amphibian populations, an in-situ field experiment examining larval growth and development, and a controlled study in a laboratory setting at the University of Alberta. The work will contribute to an understanding of downstream effects from an oil sand development in northern Alberta. Golder Project # 12-1337-0004.



**Effects of Development
on Barren-ground
Caribou**
Nunavut, Canada

The study assessed the effects of the mining sector and other developments on the behaviour and movements of caribou using a spatial dataset of collar locations combined with observations reported by local elders and hunters in Kugluktuk. Cam was the lead author of the scientific component. The study team consisted of the Kugluktuk Hunting and Trapping Organization (KHTO), and Golder Associates Ltd, and was funded by both the KHTO and the Nunavut Wildlife Management Board. A significant component of this project included community engagement and environmental stewardship. Golder Project # 10-1328-0042.

**Conservation Planning
in Central Ontario**
Ontario, Canada

Cam was the lead author and project manager for a conservation assessment of surrogate species representing biodiversity and ecosystem values in the Eastern Ontario Model Forest (as part of the National Agri-Environmental Standards Initiative). Cam used spatially-based habitat suitability models to quantify the amount and configuration of habitats for various management scenarios. These scenarios were compared in population viability analyses. Linkages to, and identification of minimum habitat requirements that sustain populations above critical thresholds were determined. Golder Project # 06-1373-052.

**Battle River Index of
Biological Integrity**
Alberta, Canada

Cam was the lead investigator for the development and testing of a fish-based Index of Biological Integrity (IBI) for the Battle River, AB. The goal was to develop a bio-monitoring tool and then quantify the health of the Battle River. Data for this project was collected by the Alberta Conservation Association, and was part of provincial efforts for developing monitoring standards. This work was published in the Water Quality Research Journal of Canada. Golder Project # 07-1373-0066.

**Monitoring Wolverine
Activity at a Diamond
Mine**
NWT, Canada

Cam was the lead investigator on a study of a comparison of effects monitoring methods for wolverine at the Diavik Diamond Mine Inc.(DDMI). The primary goal was to assist DDMI with the evaluation of their wildlife management plan. Specifically, Cam examined the efficiency of measurements obtained from DNA-based mark-recapture methods, versus snow tracking methods for monitoring temporal and spatial changes in wolverine activity (2003-2006). Golder Project # 10-1328-0028.

PROFESSIONAL AFFILIATIONS

Mid-Canada Chapter, American Fisheries Society (President 2010-11)

American Fisheries Society (Member since 2007)

Society for the Study of Amphibians and Reptiles (Member since 2001)



Education

B.Sc. (Hons) Biology with Oceanography, University of Southampton, UK, 1995

Certifications

Project Management Professional, December 2015

Standard and Wilderness First Aid, 2014

Golder Associates Ltd. – Yellowknife

Project Manager/Wildlife Biologist

Damian Panayi lives and works in the Northwest Territories. He was raised in the NWT and Nunavut, and considers this to be home. Damian’s career began in wildlife studies, but since then his work has expanded to include project management, environmental assessment, cumulative effects assessment, permitting, consultation, gap analysis, environmental baseline studies and environmental monitoring. Damian has been a Project Manager for several multi-disciplinary projects, for government, mining, exploration and infrastructure, including both desktop and field investigations. He has prepared wildlife effects monitoring plans following regulator and community consultation for six separate mining projects.

Damian also been a field biologist for several northern environmental baseline and monitoring programs, and has extensive field experience monitoring caribou, grizzly bear, wolverine, raptors and upland birds among others. He has used the results of these studies to prepare technical and plain-language reports, and has communicated the results to government and community agencies for consultation and consensus building in cross-cultural environments.

Golder is a leader in environmental and cumulative effects assessment in the Northwest Territories, and Damian has played an integral role these successes. In addition to participating in four major environmental assessments in the past decade, Golder pioneered a new, qualitative approach to cumulative effects assessment to caribou, fish and water, based on a database of development and landscape disturbance. Our approach has been adopted by CIMP and we have presented our methods in several workshops and conferences.

The integration of local and traditional knowledge is also a priority in the Northwest Territories, and Damian has assisted or undertaken several such studies to support community traditional knowledge collection, mine effects monitoring, documenting traditional land use and supporting community-based wildlife management.

Employment History

Golder Associates Ltd. – Yellowknife, Northwest Territories

Wildlife Biologist (2000 to Present)

Recent experience with permitting and monitoring of hydroelectric, mining and mineral exploration projects. Project manager for several environmental monitoring programs and an environmental assessment. Assisted with several environmental assessments and cumulative impact assessments. Project managed and field technician at remote mine wildlife monitoring programs, lead reporting of the results. Developed wildlife monitoring plans. Delivered presentations to public and technical audiences. Assisted with community meetings. Development and delivery of environmental technician training courses. Conducted environmental site assessments. Assisted with toxicology risk assessments. Used GIS software to analyse and display data. Manage databases and coordinate field programs.



PROJECT EXPERIENCE – VARIOUS

Tlicho All-Season Road
Northwest Territories, Canada
Project Manager for Golder contribution to the environmental assessment of a proposed all-season road to Whati for the GNWT. Worked with various GNWT departments and Golder technical leads to prepare an integrated environmental assessment and regulatory submissions.

Kennady North Project
Northwest Territories, Canada
Project Manager for the preparation of an environmental baseline study plan for the Kennady North Project, including identification of information needs, study design, schedule and cost estimate for terrestrial, aquatic and cultural disciplines. Also Project Manager for environmental baseline studies at the Project. Responsible for scope, budget and schedule for a multi-disciplinary environmental monitoring program.

Snap Lake
Northwest Territories, Canada
Project Manager for a multi-disciplinary environmental monitoring program at the Snap Lake Mine. Golder's team included over 30 staff undertaking a range of environmental baseline studies. Responsible for tracking scope, budget and schedule, overseeing safety for all field investigations, and client liaison. Prepared work plans for annual monitoring.

Community-Based Muskox Population Estimate
Kugluktuk, Nunavut
Hunters of Kugluktuk have observed increasing numbers of muskox near the community, and desired to increase the harvest levels. Rather than lobby the Government of Nunavut to undertake an aerial survey to estimate muskox numbers, the Hunters and Trappers Organization contracted Damian to document hunter observations and suggest ground-based survey methods that could be undertaken by community members.

Jay Project
Northwest Territories, Canada
Participated in the community consultations and environmental assessment of the Jay Project, an expansion to the Ekati Diamond Mine. Contributed to the assessment of effects to wildlife and environmental cumulative effects. Contributed to the updated Wildlife Effects Monitoring Plan and the Caribou Road Mitigation Plan

Snap Lake Mine
Northwest Territories, Canada
Project Manager for environmental monitoring at the Snap Lake Mine. Managing a multi-disciplinary team, and project management team. Implementation of field studies for water licence and, use permit, and additional special studies.

Thaidene Nene National Park
Northwest Territories, Canada
Undertook a literature review and ecological values review for the Parks Canada Thaidene Nene (East Arm) National Park Proposal. Used advanced literature review methods using Golder's internal library resources to quickly search a wide range of sources.

Database of Landscape Disturbance
Northwest Territories, Canada
With assistance from the Cumulative Impact Monitoring Program, developed a database describing human activity and landscape disturbance in the North and South Slave, and Inuvialuit Settlement Regions of the Northwest Territories. This database can be used to provide a quantitative estimate of cumulative effects. The database brings together many different sources of information, such as land use permits, water licences, land leases, roads, transmission lines, parks, and communities. The database has since been used in the cumulative effects assessment of four recent projects in the NWT.



- NICO Project**
Northwest Territories,
Canada
- Conducted wildlife baseline surveys at an exploration property, and assisted with study design. Surveys have included aerial surveys for ungulates, raptors and waterfowl, and ground-based songbird, snow track and browse/pellet surveys. Reported on the results. Contributed to the environmental assessment, and participated in technical and public hearings. Prepared Wildlife Monitoring and Wildlife Habitat Protection Plans.
- Taltson Hydroelectric Expansion Project**
Northwest Territories,
Canada
- Internal project manager and technical lead for the environmental assessment of the proposed Taltson Hydroelectric Expansion Project. Worked with multi-consultant team to develop assessment methods and cumulative effects assessment approach. Managed internal team to conduct an assessment of incremental and cumulative effects to wildlife and land-users. Designed and implemented aerial survey studies to document baseline conditions along the proposed routes of a proposed transmission line. Conducted literature review regarding the possible impacts of a transmission line to wildlife.
- Effects of Human Activity to Caribou**
Nunavut, Canada
- With assistance from the Nunavut Wildlife Management Board and in partnership with the Kugluktuk Hunters and Trappers Organization, assisted with and managed an investigation into the effects of human development and activity to barren-ground caribou, using both Inuit traditional knowledge, and spatial analysis of collared caribou movements. A key goal was the integration of traditional knowledge and science.
- Lutsel Ke Mini Hydro**
Northwest Territories,
Canada
- Project manager and technical lead for the scoping of effects to the terrestrial environment for a proposed transmission line and run-of-river mini hydro development on the Snowdrift River.
- Gahcho Kue Project**
Northwest Territories,
Canada
- Contributed to the environmental review document for the proposed Gahcho Kue diamond mine. Major contributions included a summary of the mine's cumulative effects, and preparation of Wildlife Monitoring and Wildlife Habitat Protection Plans.
- Discovery Mine**
Northwest Territories,
Canada
- Completed a review of dozens of documents from many different disciplines to assess the success of closure and closure monitoring at the Discovery Mine site. The information was distilled into a single report discussing the success of monitoring activities to date at the Discovery Mine.
- Jericho Diamond Mine**
Nunavut Territory,
Canada
- Developed and implemented a wildlife monitoring plan for the Jericho Diamond Mine, and worked with regulatory agencies to gain approval of the plan. Conducted wildlife monitoring and reported on results.



Bluefish Hydroelectric
Northwest Territories,
Canada

Project manager for regulatory and monitoring support to NTPC for hydro plant expansion. Assisted the Northwest Territories Power Corporation with the strategic advice for permitting, regulatory engagement, and acquisition of land use permit, water licence and Fisheries Act Authorization required to construct a new dam at the Bluefish hydroelectric facility. Also managed the preparation or update of eleven environmental monitoring plans, and assisted in gaining approval for these plans from the Mackenzie Valley Land and Water Board. Currently assisting NTPC with environmental monitoring and annual reporting, implementation of water flow and mercury monitoring plans required by the Water Licence and Fisheries Act Authorization.

**Behchoko Fish
Monitoring Pilot Study**
Northwest Territories,
Canada

Assisted with a community-based fisheries monitoring program. Working with community youth and elders, three days of fish collections were conducted on Marian Lake and Great Slave Lake. Fish health and demographic information was collected to test the feasibility of a community-based monitoring program

Meliadine Gold Project
Nunavut Territory,
Canada

Assisted with environmental assessment and completed a review of the existing wildlife information collected at the Meliadine Property, identified gaps, and designed a field program to fill gaps and update data. Assisted with field investigations

Hope Bay Gold Project
Nunavut Territory,
Canada

Assisted with the development and implementation of a wildlife monitoring plan for the Doris North Project. Assisted with baseline environmental studies.

**Various contaminated
sites**
Northwest
Territories/Nunavut
Territory, Canada

Assisted with Phase 1 and 2 Environmental Site Assessments of three exploration camps in the Kitikmeot region of the Nunavut Territory. Assisted with reporting on two environmental site assessments of two abandoned mines in the Great Bear Lake area, Northwest Territories. Conducted field investigations and assisted with the risk assessment of the abandoned Tundra Mine, Northwest Territories.

Ekati Diamond Mine
Northwest Territories,
Canada

Lead technician and author for the Ekati Wildlife Effects Monitoring Program, 2000 to 2003. Results from this monitoring program are submitted to the Independent Environmental Monitoring Agency, and government agencies. VECs were monitored to assess the impact of the mine on wildlife, with a major emphasis on caribou, carnivores, and upland breeding birds. Trained wildlife technicians, conducted surveys of all VEC species, and implemented Wildlife Effects Monitoring Plan. Assisted with database design, and communicated results and issues with government biologists.



PROFESSIONAL AFFILIATIONS

Project Management Professional (PMP). Certified December 2015.

PUBLICATIONS

Other

Caribou Road Mitigation Plan for the Jay Project, Ekati Diamond Mine. Prepared for Dominion Diamonds Corp.

Wildlife Effects Monitoring Program for the Jay Project, Ekati Diamond Mine. Prepared for Dominion Diamonds Corp.

Fisheries Studies at the Bluefish Hydroelectric Station. 2013. Prepared for the NWT Power Corporation.

Wildlife and Wildlife Habitat Protection Plan, and Wildlife Effects Monitoring Plan. NICO Project. Prepared for Fortune Minerals Inc.

Effects of Development on Barren-ground Caribou: Insight from Traditional Knowledge and Ecological Model. 2011. Prepared for the Kugluktuk Hunters and Trappers Organization.

Comprehensive Remediation Assessment Report for the Discovery Mine. 2010. Prepared for Indian and Northern Affairs Canada.

Wildlife and Wildlife Habitat Protection Plan, and Wildlife Effects Monitoring Plan. Gahcho Kue Project. Prepared for De Beers Canada Inc.

Terrestrial Environment and Project Effects Scoping Report, Bluefish Hydro Dam Replacement Project. Prepared for the Northwest Territories Power Corporation.

Taltson Hydroelectric Expansion Project Developer's Assessment Report. Prepared for Deze Energy Corporation for the Mackenzie Valley Environmental Impact Review Board.

Golder Associates 2008. 2007 Jericho Diamond Project Wildlife Monitoring Program Data Summary. Prepared for Tahera Diamond Corporation.

Autumn and Winter Wildlife Studies for the Taltson Hydroelectric Expansion Project. 2006. Prepared for the Northwest Territories Energy Corporation.

Wildlife and Wildlife Habitat Studies for The Taltson Hydroelectric Expansion Project. 2006. Prepared for the Northwest Territories Energy Corporation.



Environmental Baseline Studies at the NICO Property, 1998 to 2005. Prepared for Fortune Minerals Inc.

Wildlife Mitigation and Monitoring Plan. Jericho Diamond Project. 2005. Prepared for the Tahera Diamond Corporation.

Golder Associates 2005. Wildlife Monitoring Studies at the Snap Lake Diamond Project, 1999 to 2004. Prepared for De Beers Canada Inc.

Golder Associates 2004. Terrestrial and Aquatic Field Surveys and Ecological Risk Assessment for the Tundra Mine. Prepared for Indian and Northern Affairs Canada, Contaminants Division.

Golder Associates 2004. Enhanced Phase 2 Environmental Site Assessment of the Speers Lake Exploration Camp, Nunavut. Prepared for Public Works and Government Services Canada. Edmonton, Alberta.

Golder Associates 2004. Enhanced Phase 2 Environmental Site Assessment of the McGregor Lake Exploration Camp, Nunavut. Prepared for Public Works and Government Services Canada. Edmonton, Alberta.

Golder Associates 2004. Enhanced Phase 1 Site Assessment, El Bonanza Mine, Northwest Territories. Prepared for Indian and Northern Affairs Canada, Contaminants Division.

Golder Associates 2004. Enhanced Phase 1 Site Assessment, Indore Mine, Northwest Territories. Prepared for Indian and Northern Affairs Canada, Contaminants Division.

Golder Associates 2004. Colomac Site Remediation Plan Technical Review. Prepared for Indian and Northern Affairs Canada, Contaminants Division.

Golder Associates 2004. Phase 1 Environmental Site Assessment of a private commercial property. Prepared for the CIBC Bank, Yellowknife, Northwest Territories.

Golder Associates 2003. Phase 1 Environmental Site Assessment of the Former St. Anne Hospital Site, Fort Smith, Northwest Territories. Prepared for the Uncle Gabe Friendship Centre, Fort Smith, Northwest Territories.



Golder Associates 2003. Environmental Review of Diamond Mining Sector. Prepared by Golder Associates Ltd. for Environment Canada, Government of Canada.

De Beers 2002. Snap Lake Wildlife Monitoring Report. Prepared by Golder Associates for De Beers Canada Mining Inc.

BHP Billiton 2003. Ekati Diamond Mine 2002 Wildlife Effects Monitoring Program. Prepared by Golder Associates for BHP Billiton Diamonds Inc.

Golder Associates 2002. Environmental Impact Assessment for the WesternGeco Mackenzie River 2D Seismic Program. Prepared for WesternGeco.

Golder Associates 2002. Supporting Documentation for a Land Use Permit Application for a Northwest Tel Microwave Tower. Prepared for Northwest Tel.

Golder Associates 2002. A Functional Review of Geomatics within the N.W.T. Department of Resources, Wildlife, and Economic Development. Prepared for the department of Resources, Wildlife, and Economic Development, Government of the Northwest Territories.

BHP Billiton 2002. Ekati Diamond Mine 2001 Wildlife Effects Monitoring Program. Prepared by Golder Associates Ltd. for BHP Billiton Diamonds Inc.

Golder Associates 2002. Snap Lake Diamond Project Wildlife Monitoring Report. Prepared by Golder Associates for De Beers Canada Mining Inc.

Golder Associates. 2001. Environmental Impact Assessment of the Snap Lake Diamond Project. Prepared for De Beers Canada Mining Inc.

BHP 2001. Ekati Diamond Mine 2000 Wildlife Effects Monitoring Program. Prepared by Golder Associates Ltd.



Golder Associates Ltd. – Calgary

Education

*M.A. Geography
(Socio-Cultural),
University of Calgary, 2010*

*B.A. (hons) Geography
(Environmental),
University of Calgary, 2008*

Languages

English – Fluent

Socio-Economist & Social Impact Assessment Specialist

January 2011 - Current

As a social impact assessment practitioner, Jesse focuses on the social, economic, cultural, and land and resource use aspects of environmental and social impact assessments (ESIA). Jesse leads the social components of ESIA's, with a focus on methodology design, baseline studies, impact assessments, social management plans, and strategic regulatory briefings. He also acts as a coordinator for the socio-cultural team during regulatory proceedings.

The majority of Jesse's work considers the social, economic and land use effects of the development of the mining sector, and is geographically focused on the Canadian Arctic. Through his involvement as the socio-economic lead for the ESIA's of projects throughout the North, Jesse has developed an understanding of the importance of land and water resources to the livelihood, health, and cultural wellbeing of those potentially impacted by resource development near Northern communities. He has also developed a strong understanding of the constraints to and nuances of Northern business and local content development.

In addition to his work in the Canadian Arctic, Jesse has worked on projects in Southern Canada, Eastern Europe, Mexico, the Caribbean, Brazil, and West Africa. Most of this work has been in the mining and mid-stream oil and gas industries. Jesse has acted as a socio-economic lead and author on over three dozen Projects to date, and has provided technical review and input into Projects lead out of other Golder offices.

Jesse has experience conducting participatory research and focus group interviews, and has designed survey and qualitative research programs that aim to characterize regional social, economic and land use conditions through community-level analysis. He has also conducted procurement analyses for developers aimed at identifying strategies to maximize local business development and labour participation, and improving reporting of success against local content targets.

Prior to joining Golder, Jesse worked as an administrator (2010), teaching assistant (2008-2010), and research assistant (2006-2008) for the University of Calgary; as a clerk at the Medicine Hat Public Library (2002-2006); and as a bookkeeper with L&L Bookkeeping (2002-2004).

Jesse holds a M.A. in Geography (Socio-Cultural focus), with a thesis on the spatial, psychological, and socio-economic acculturation process of Canadians and Americans permanently expatriating to Mexico. His research considered how the development of the expatriate's collective sense of place shaped and altered the physical space they inhabited, changing the local landscape. Research involved living in a small town in Yucatan, Mexico, conducting systematic spatial observation and intensive interviews with a sample population. He also holds a B.A. (hons) in Geography (Environmental focus), with a thesis on the effects of climate change on carbon cycling in the wetland ecosystems of Southern Quebec, and resulting implications for human use (peat harvesting).



SELECT PROJECT EXPERIENCE

NORTHERN PROJECTS

**Dominion Diamond -
Ekati Diamond Mine
Extension**
NWT, Canada

Discipline Lead: Prepared a socio-economic and land use impact assessment, including the analysis of project effects on local population demographics and wellbeing, the territorial economy and labour market, community infrastructure and services, and land and natural resource use (e.g., fishing, hunting, tourism). Led community engagement activities aimed at facilitating stakeholder input into the results of the environmental assessment, and the development of social management practices for the proposed extension.

Conducted a procurement analysis of the existing Ekati operation to determine where local business development activities should be focused. Provided strategic advice regarding socio-economic trends, issues and recent regulatory requirements in the NWT to the client's senior leadership team, and served as a subject matter specialist in technical sessions and hearing preparation activities.

Regulatory Engagement Lead: Led regulatory engagement activities following the submission of the Developer's Assessment Report, including community workshops. Prepared materials that summarize the results of the biophysical and human environment impact assessments for presentation to communities.

**Rio Tinto -
Diavik Diamond Mine**
NWT, Canada

Discipline Lead: Lead an expert team to prepare a socio-economic assessment of the impact of the future closure of the mine on communities and the territorial economy. This included a discussion of population dynamics in the predicted labour market, and associated impacts to housing, infrastructure and service provision. The assessment also discusses the impact to community benefits brought about by agreements signed between communities and the mine operator.

**Government of the
Northwest Territories –
Tfíchô All-Season
Road**
NWT, Canada

Discipline Lead: Conducting a socio-economic impact assessment for the development of an all-season road connecting the remote Hamlet of Whatì to the territorial Highway system. Road transportation to Whatì is currently limited to a season period when the winter road to the community is operational. The impact analysis describes changes in community wellbeing and structure, the viability of local businesses, and potential impacts on existing social issues in the community associated with year-round road access to other communities and larger centres.

**De Beers - Gahcho Kue
Diamond Mine**
NWT, Canada

Author: Respond to MVEIRB Information Requests and Technical Comments relating to socio-economics, traditional land use, and land use and management. Contribute to the social management plan for the proposed mine. Provide strategic support during the regulatory process.

**Agnico Eagle -
Amaruq Hovercraft
Pilot Study**
NU, Canada

Screening Assessment Lead: Lead a multi-disciplinary team of environmental scientist to conduct a screening assessment of the use of hovercraft technology for the transportation of personnel and equipment along all-weather and winter roads between the Meadowbank Mine and the Amaruq Exploration site in Kivalliq.

Project Manager: Managed report production, budget, scope and schedule for the aforementioned screening assessment, and acted as the client liaison.



**Agnico Eagle -
Meadowbank Mine
Whale Tail Expansion**
NU, Canada

Discipline Lead: Prepared a socio-economic and land use impact assessment for the expansion of the Meadowbank Gold Mine, and drafted a Socio-Economic Monitoring and Management Plans for the Project that included a discussion of local procurement and business development targets and maximization strategies. Also acted as coordinator for all human environment disciplines, and as a technical reviewer for the Traditional Land Use assessment. Provided extensive post-submission regulatory support.

**Agnico Eagle -
Meliadine Gold Mine**
NU, Canada

Author: Prepared the socio-economic and land and resource use baseline reports and impact assessment identifying current socio-economic conditions in the Kivalliq region, land uses near the Project, and Project-driven impacts.

Regulatory Coordinator: Coordinated the Information Request process and hearing preparation for socio-economics, land use and management, and traditional land and resource use.

**AREVA Resources -
Kiggavik Uranium Mine**
NU, Canada

Author: Responded to community and regulator Information Requests and Technical Comments relating to the Project's Environmental Impact Statement (EIS), in the areas of socio-economics, traditional land use and knowledge, and land and natural resource use. Also contributed to the social management plan for the proposed mine, aimed at mitigating and monitoring the Project's potential adverse social, economic, and land use effects.

**Parks Canada -
Highway 5
Improvement**
NWT, Canada

Author: Prepared a Basic Impact Assessment (BIA) and Project Description for the proposed widening and improvement of Highway 5 in Wood Buffalo National Park and UNESCO World Heritage Site. Sections written included soil and terrain, air quality, cultural resources, visitor experience, and the project description.

MINING (INTERNATIONAL AND SOUTHERN DOMESTIC)

**Euromax -
Ilovica Gold Mine**
Southeast Region,
Republic of Macedonia

Discipline Lead: Prepared the socio-economic baseline and impact assessment for a proposed gold/copper mine. Designed and implemented a household survey in two villages in Southern Macedonia aimed at determining the socio-economic characteristics of the population, and a land use study detailing the regional reliance on agricultural land use and exploitation of natural resources for livelihoods. This involved the training and supervision of a team of subcontractors, and overseeing data processing and analysis activities.

Author: Prepared a Land Acquisition and Compensation Plan (LACP) that identifies the regulatory and legal framework (EBRD and Macedonian) around, and the execution of Project-related land acquisition activities. Participated in the development of social, human resources, procurement and health and safety management plans for the proposed project, to IFC standards, and in the assessment of associated power infrastructure.

Project Manager: Managed Canadian operations (finance, logistics, health and safety, administration) on a multidisciplinary baseline study conducted in the Republic of Macedonia.



BHP Billiton, Société des Mines de Fer de Guinée (SMFG) - Nimba Iron Project
N'Zerekore, Guinea

Author: Drafted the protected areas and natural resource Use impact assessments for a proposed mine in a UNESCO world heritage site, and contributed to the development of the social assessment methodology, the socio-economic baseline and impact assessment, the land tenure assessment, and the traffic assessment.

Teck Resources Limited - Elk Valley Operations
BC, Canada

Logistics Coordinator: Pre-field logistics and H&S coordination for a large, multi-disciplinary/multi-national team of physical and social scientists conducting an SEIA over the course of several years. Also provided financial management support to senior Project Directors, and oversaw the Project wrap-up process for Canadian operations.

TrasAlta - Highvale Coal Mine
AB, Canada

Facilitator and Impact Assessment Specialist: Facilitated multi-day workshops aimed at identifying the cumulative socio-economic impacts of Teck Resources' combined Elk Valley coal mining operations, and developed impact matrixes for incorporation in a Social Baseline and Impact Assessment (SBIA).

Torex Gold - Morelos Gold Mine
Guerrero, Mexico

Discipline Lead: Prepared the socio-economic and land use and management baselines and impact assessments for the expansion of a coal mine in support of an industrial approval application. Also assisted in annual reporting on environmental performance of associated power and water treatment infrastructure.

Author: Provided technical input into a Resettlement Action Plan (RAP), and acted as the statistical reviewer for statistics presented in the socio-economic baseline.

INFRASTRUCTURE

University of the West Indies – Campus Expansions
Belize, Dominica, St. Kitts and Nevis, and Trinidad and Tobago

Discipline Lead: Conducted a socio-economic impact assessment for the expansion of four campuses of the University of the West Indies funded through support from the Canadian International Development Agency (CIDA). Oversaw the preparation of four socio-economic baseline reports describing existing economic, social and physical infrastructure conditions in Belize, the Federation of St. Kitts and Nevis, the Commonwealth of Dominica, and the Republic of Trinidad and Tobago.

Parks Canada and Public Works - Icefield Pathway
Jasper National Park, AB, Canada

Discipline Lead: Lead the “visitor experience” component of a Detailed Impact Analysis (DIA) for the Jasper-to-Icefields Discovery Centre portion of the proposed Icefield Pathway. Technical focus on visitation, education experience of visitors, usability by user groups, and the interaction of the trail with tourism infrastructure and contaminated sites. Participated in field alignment routing activities.

Parks Canada - Highway 1 Twinning
Yoho, BC, Canada

Discipline Lead: Lead the “visitor experience” component of a constraints analysis for the twinning of the TransCanada Highway near Field, BC, in Yoho National Park.

Geo-Chemical Assessment – Peat Operation
PQ - Southern Townships, Canada

Research Coordinator: Designed and implemented a collaborative environmental assessment project aimed at determining the effects of water table drawdown on peatland carbon cycling. Duties included conducting literature reviews, the design of data collection devices, fieldwork, laboratory and statistical data analysis and reporting, and the supervision and training staff.



CULTURAL SCIENCES

**Métis Local 1935 -
Historical Atlas**
AB - RMWB, Canada

Author: Historical Atlas: Responsible for data collection, transcript coding and preparation of a historical land use atlas for the Métis Local 1935. The Atlas draws on the experiences of over 100 Métis Elders with regard to Traditional Resource Use, Lifeways, History, Family and Culture.

OIL & GAS

**TransCanada -
EMP (NEB 52)**
ON, Canada

Methodology Advisor and Reviewer: Provided guidance to the socio-economic and land use team, and acted as a technical reviewer of NEB human environment components for an assessment of the Eastern Mainline Project.

**TransCanada – 15
Projects (NEB 52/58)**
AB/BC, Canada

Discipline Lead and Reviewer: Oversee and contribute to the preparation of the socio-economic and land use and management sections of 15 pipeline and compressor station NEB Environmental and Socio-economic impact assessments over the past decade.

**Canadian Natural –
Horizon North Pit
Expansion**
AB, Canada

Discipline Lead: Preparing a socio-economic and land use baseline and impact assessment for a proposed oil sands mine in northern Alberta. Analysis considers the dramatically changed economic, labour market, and population context of the region during a bust cycle, and associated Project impacts.

**ConocoPhillips -
Undisclosed Offshore
Project**
NWT, Canada

Author: Provided input into and wrote sections of a Benefits Plan for the developer that included a discussion of strategies for maximizing local business development and building business and labour force capacity in Northern communities.

**Imperial Oil - Beaufort
Sea Offshore Project**
NWT, Canada

Author: Provided input into and wrote sections of a socio-economic and land and resource use baseline and impact assessment.

**Cenovus Energy Inc. -
Phase H Project**
AB, Canada

Discipline Lead: Oversaw the preparation of a Land Use and Management baseline and impact assessment for a proposed SAGD project.

**Cenovus Energy Inc. -
Pelican Lake Project**
AB, Canada

Discipline Lead: Prepared a socio-economic and land use baseline and impact assessment for a proposed SAGD project. Conducted key informant and focus group interviews with stakeholders and Aboriginal communities.

**Shell - Jackpine Mine
Expansion Project**
AB, Canada

Author: Contributed to the development of the Project's Cultural Effects and Traditional Land Use Assessments.

**ConocoPhillips -
Surmont Project**
AB, Canada

Author: Provided input into a land and resource use baseline and impact assessment for a proposed SAGD project.

**Canadian Natural -
Kirby North Expansion**
AB, Canada

Regulatory Coordinator: Through secondment, coordinated the client's technical responses to Supplemental Information Requests from regulatory bodies and intervenor groups.



Education

Ph.D. Biological Sciences (Ecology), University of Alberta, Edmonton, Alberta, 2010

M.A. Anthropology (Primatology), University of Calgary, Calgary, Alberta, 2004

B.Sc. Anthropology, University of Calgary, Calgary, Alberta, 2002

Golder Associates Ltd. – Calgary

Senior Wildlife Biologist

Dr. Kyle Knopff is a professional biologist and Environmental Impact Assessment specialist with over 12 years of experience. Since joining Golder, Kyle's work has focused on achieving biodiversity conservation through impact assessment. Kyle has worked on a wide variety of development projects all over the world.

Kyle's primary duties at Golder include coordination and implementation of field programs, preparation of baseline reports, environmental assessments, ecological risk assessments, biodiversity management plans, cumulative effects management plans, and monitoring programs. Kyle leads biodiversity components of large EIAs and ESIA's internationally. He is responsible for study design and statistical analyses, including habitat and population modelling using resource selection functions (RSFs) and population viability analyses (PVA), among others. Kyle prepares and delivered specialized technical reports to meet the unique needs of clients, such as quantitative wildlife corridor evaluations, biodiversity risk evaluations, and biodiversity offset strategies.

Kyle was trained as a quantitative ecologist at the University of Alberta (where he received his PhD) and he brings considerable technical expertise to Golder's global biodiversity team. Kyle has published 14 peer reviewed papers in academic journals, contributed to 2 book chapters in edited volumes, and authored dozens of professional interest articles and technical papers. Much of Kyle's published work focuses on large mammal predator-prey systems, including caribou-wolf systems in Alberta. Throughout his career, Kyle has worked closely with government, industry, academic institutions, and environmental organizations to provide innovative solutions to complex problems pertaining to biodiversity conservation.

SELECT PROJECT EXPERIENCE

Species Specialist (Cougars)
Alberta, Canada

Part of a team of four authors who prepared the most recent (2012) cougar management plan for the province of Alberta

Oil Sands Leadership Initiative
Alberta, Canada

Conducted a feasibility study for the application of predator exclusion fencing to mitigate adverse impacts to caribou in Alberta's Oil Sands. Feasibility evaluation included technical, ecological, political, and economic considerations.

Trans Canada - Leismer pipeline
Alberta, Canada

Part of a team developing a framework to achieve offsets for caribou to compensate for adverse effects from a pipeline project. Audited and provided constructive feedback for an offset plan prepared by another consultant.

Brewster Canada - Glacier Skywalk
Alberta, Canada

Technical lead responsible for assessing potential impacts of the Glacier Skywalk on mountain goats and bighorn sheep in Jasper National Park. Prepared EA, including mitigation options to minimize environmental impacts and facilitate project approval. Developed and implemented a 5 year monitoring program (ongoing until 2017) to test predictions of the EA. Worked closely with Parks Canada to achieve optimal solutions. In 2014, Golder received an award of merit in the environment category from the Consulting Engineers of Alberta for our work on this project.



PricewaterhouseCoopers Inc. - TSMV receivership
Alberta, Canada

Technical lead responsible for defining and evaluating wildlife corridors for TSMV development in Canmore. Responsibilities included data analysis, report writing and stakeholder engagement, including public meetings and presentations to the Mayor and Council. Statistical modelling of wildlife habitat relationships for corridor evaluation was based heavily on resource selection functions (RSFs) developed from telemetry data for elk, cougars, grizzly bears, and wolves. Final corridor delineation was accomplished in close collaboration with the Province of Alberta.

Sunshine Village
Alberta, Canada

Conducted a study of wildlife movement patterns during winter 2013 using remote cameras and winter tracking to evaluate wildlife movement corridors in the vicinity of Sunshine Village in Banff National Park.

Teck Coal - Elk View Baldy Ridge Expansion
British Columbia, Canada

Overall biodiversity lead (including sections on ecosystems, wildlife, vegetation, fish) for the environmental assessment being prepared for the EVO BRE Project. Duties included data collection in the field, report writing, providing direction to a large team of staff, and senior technical review.

Teck Coal - Elk View Conceptual Closure Plan
British Columbia, Canada

One of two primary authors of a conceptual closure plan prepared for Elkview Operation, a large open pit coal mining operation in British Columbia, Canada.

Capital Power
Alberta, Canada

Project manager and lead scientist for a study of cougar population status and habitat selection patterns near Capital Power's Genesee Generating Station. Responsible for study design, data collection, report writing, and community consultation. The study's first phase employed winter tracking to assess abundance and distribution of cougars and the second phase used radiotelemetry on a sample of cougars to assess fine-scale aspects of cougar behaviour and ecology on and around the Generating Station property.

Teck Coal - Biodiversity Program - Loss-gain calculations for wildlife
British Columbia, Canada

Lead author of a report providing methods for loss gain calculations for 10 wildlife species. Models developed are capable of calculating conditions for wildlife from a pre-mining condition through to a closure landscape. Models were designed for use as part of a broader biodiversity management plan with a goal of achieving a net positive impact.

Samaro – Fundao Dam Failure Environmental Rehabilitation Program
Brazil

Biodiversity lead responsible for preparing an environmental rehabilitation plan with the intent of achieving no-net-loss or a net positive impact for biodiversity relative to the impacts caused by the dam breach, including for terrestrial, freshwater aquatic and coastal & marine biodiversity. Responsible for leading a team of international experts working to implement the plan.

Brazil Potash - Autazes Project
Amazonas, Brazil

Provided senior technical input, direction, and review for a cumulative effects assessment and critical habitat assessment (to IFC PS6 standards) for a proposed potash mine in a tropical rainforest in the Brazilian Amazon.

Teck Coal - Biodiversity Program - Pre-mining ecosystem conditions mapping
British Columbia, Canada

Technical director for a project that mapped ecosystem conditions prior to mine development for 5 large coal mines that had been in operations for decades in the Elk Valley. Ecosystems were mapped using aerial imagery obtained prior to mine development (in some cases as early as the 1950s). Ecosystem conditions will be used to understand historic losses associated with each mine in pursuit of Teck's goal NPI for biodiversity for each of their operations.



SMFG Nimba Iron Ore Project
Guinea, West Africa

Provided senior technical review and oversight for biodiversity disciplines for a baseline and preliminary ESIA for a mining project proposed in a global biodiversity hotspot. The ESIA was prepared with the objective of meeting IFC 2012. Specific responsibilities included developing approaches for critical habitat identification and environmental assessment conducted applying the principle of net-positive impact for highly sensitive biodiversity values.

Eramet - Mabounie Project
Gabon, Central Africa

Fauna lead for a comprehensive baseline study conducted to 2012 IFC PS6 standards, including identification of critical habitat for unique and highly threatened biodiversity values. Designed field programs and managed large numbers of sub-contractors in the field over the course of more than 16 months, including several site visits to be directly involved in data collection. Data collection occurred in an area previously unexplored by scientists. Worked closely with ENGOs and international experts for different taxonomic groups to quantify biodiversity values present and potentially present, including species new to science. Duties also included reporting and critical habitat assessment across biodiversity disciplines.

Eramet - Mabounie Project
Gabon, Central Africa

Biodiversity lead conducting an ecological risk assessment for a proposed rail route through a largely undisturbed tropical rainforest. Biodiversity values of concern included elephants and great apes. Worked closely with ENGOs and a variety of international experts in various taxonomic groups.

Teck Coal - Biodiversity Program - Cumulative Effects Management
British Columbia, Canada

Lead author of a report outlining Teck's approach to cumulative effects management as part of their biodiversity management planning in the Elk Valley. The report demonstrated how managing incremental effects of each operation would be integrated with broader cumulative effects management objectives for the Elk Valley.

Bellatrix - O'Chiese
Alberta, Canada

Prepared a regional effects assessment (investigating cumulative effects for ecosystems and wildlife) for a project involving a large number of wellsites, roads and pipelines on the O'Chiese First Nation reserve in west-central Alberta. The assessment was submitted to the Indian Oil and Gas Commission of Canada as part of the permitting process.

Agip KCO - Kashagan project
Kazakhstan

Lead author of a risk assessment and action plan to mitigate adverse impacts to birds from a variety of on- and off-shore risk sources including offshore platforms, flares, onshore infrastructure and contaminated waste sites. The action plan detailed specific actions required, equipment necessary, and cost of implementation for each primary on and off shore facility. Project included consultation with operations personnel in Atyrau to identify appropriate mitigation that was technically feasible given operating constraints.

Shell Canada Ltd. - Peirre River Mine
Alberta, Canada

Advised Shell on biodiversity offset planning and implementation in Alberta; developed methods for determining significance of cumulative effects for key indicator resources assess for the terrestrial disciplines as part of an EIA; and contributed to the write-up of significance determinations for some indicators.

Teck Coal - Fording River Swift
British Columbia, Canada

Lead author of the biodiversity assessment for the Fording River Swift Project environmental assessment. Duties also included responding to information requests and consultation with First Nations, Regulators, and the public.



- Ram Coal**
Alberta, Canada
- Senior technical review and oversight for terrestrial disciplines, especially wildlife, for baseline studied for a proposed underground mining project in west-central Alberta. Duties included data collection in the field, report writing, and consultation with regulators.
- Teck Coal - Line Creek Phase II**
British Columbia, Canada
- Wildlife lead for a pre-development assessment for the Elk Valley. Conducted review of historical documents and maps to evaluate cumulative effects of development on wildlife in the Elk Valley over the past 150 years. Conducted quantitative assessment of habitat changes between 1950s and 2010. Actively participated in meetings with regulators and consultants hired by the Ktunaxa First Nation.
- Teck Coal - Line Creek Phase II**
British Columbia, Canada
- Prepared a Migratory Birds Convention Act (MBCA) due diligence assessment for Line Creek Phase II. This assessment summarized the legal requirements of the (MBCA) and described their application in a mining context. Recommendations for Teck to achieve due diligence with respect to the act also were presented.
- Teck Coal - Fording River Swift**
British Columbia, Canada
- Technical lead in charge of preparing a wildlife assessment for the Turnbull Tailings Pipeline at Teck's Fording River Operation. Conducted both fieldwork and reporting, including identification of sensitive habitats or species that might be adversely affected by the project and proposing appropriate mitigation measures.
- Teck Coal - Line Creek Phase II**
British Columbia, Canada
- Developed a framework for a cumulative effects management plan for the terrestrial component of the environment in the Elk Valley. This framework encompassed several operating mines in the Elk Valley and included methods to link cumulative effects management to operation scale biodiversity management plans and reclamation plans to achieve net positive impact to biodiversity.
- Teck Coal - Line Creek Phase II**
British Columbia, Canada
- Wildlife component lead for the environmental assessment. Conducted an extensive literature review, compiled data and prepared a baseline report describing wildlife and wildlife habitat present in the vicinity of a proposed open-pit coal mine. Responsible for preparing the environmental assessment for wildlife, including wildlife modelling. Actively participated in terrestrial working group meetings with regulators and consultants hired by the Ktunaxa First Nation.