

November 13, 2020

Our File: OWA 1120

Bruce Kilgour: Summary of Expertise

Lake Sturgeon

Dr. Kilgour has worked extensively with Lake Sturgeon (*Acipenser fulvescens*) on the Spanish and Vermilion Rivers through studies conducted to assess the effects of hydroelectric development on the species. Survey methods for Lake Sturgeon have included River Index Nets, boat electrofishing, seining, deep-water minnow traps, and larval drift nets. Survey data have been used to validate spawning habitat suitability models. Validated HSI's were then subsequently used to assess the effects of generating station operational regimes and design variations on spawning habitat suitability.

Dr. Kilgour also evaluated the effects of the proposed Yellow Falls hydroelectric generating station on Lake Sturgeon populations in the Mattagami River.

Turtles

Dr. Kilgour has directed numerous studies to survey for and/or monitor Blanding's Turtles (*Emydoidea blandingii*) in surface waters in and around Ottawa, Peterborough and Sudbury. Those surveys invariably result in other turtle species being documented, including Eastern Painted Turtle (*Chrysemys picta*), Snapping Turtle (*Chelydra serpentina*) and Northern Map Turtle (*Graptemys geographica*). Monitoring techniques have generally focused on basking surveys. Dr. Kilgour has led monitoring programs that have also incorporated trail cameras focused on basking structures to increase the monitoring period and data collected. Survey programs have supported hydroelectric redevelopment on the Spanish River and hydroelectric generation station upgrades on the Vermilion River, as well as land development and mining operations.

Molluscs

Dr. Kilgour was part of a study team that documented rare and endangered Unionidae (mussels) of the Sydenham River near London, Ontario. The field work he conducted was subsequently published (Mackie and Topping, Cdn Field Nat., 102:617). That work then subsequently supported an assessment of the status and trends of species at risk in the Sydenham River, including Unionidae, which was published by Staton et al. (Env Mon Ass, 88:283; an article co-authored by Dr. Kilgour). Dr. Kilgour is familiar with distributions of Mollusca, having studied and published on bivalves in the Ottawa River (Nautilus 102:73-77), and as part of the hundreds of benthic sampling programs he has directed across Ontario and the rest of Canada. Dr. Kilgour's other mollusc-related (bivalves) peer-reviewed contributions can be found here: Am Mal Bull 7:109-115; Can J Zoo, 68:1568; J N Am Benth Soc 10:68.

Surface Water Quality Subject Matter Expert

Dr. Kilgour is recognized across Canada as an expert in water quality effects on aquatic organisms. He has been qualified as an 'expert witness' on the toxicity metals to aquatic organisms to provide testimony in Ontario's provincial courts. He is the 'Independent Scientist' on the Elk Valley Environmental Monitoring Committee, a committee that oversees the monitoring of water quality

in the Elk River downstream of extensive coal mining in British Columbia's interior. He has been retained as a third-party expert to review water quality monitoring programs for diamond mining operations in the territories. He has been retained on numerous occasions by Environment Canada and Ontario Ministry of the Environment) to provide advice on procedures for deriving federal and provincial water quality guidelines. He has been retained by Environment Canada to provide technical advice for improving approaches to Environmental Effects Monitoring for the pulp and paper and metal mining sectors. He has co-authored a variety of papers related to water quality (e.g., *Env Tox Chem* 37:2296; *Wat Qual Res J Can* 48:1; 53:231).

Fish Sampling Subject Matter Expert

Dr. Kilgour has extensive experience in sampling fishes across Canada in various freshwater and marine (offshore) environments. His work has been completed for a variety of industrial sectors including land developers, metal mines, offshore oil and gas, oil sands, coal and hydroelectric development. He co-authored and edited the Ontario Stream Assessment Protocol from 1995 to approximately 2005. He has published a number of articles that document anthropogenic influences on fish (*Am Fish Soc Symp* 48:577, 48:626; *Env Tox Chem* 38:1890; *Env Rev* 26:333).

Expertise and Experience in Development of Mitigation, Effects Monitoring and Effectiveness Monitoring Plans

Dr. Kilgour has worked with both agencies and industry in developing best practices mitigations and site-specific mitigations for hydropower facilities. Dr. Kilgour and staff supported DFO in the development of operational statements that guided in-water works practices for projects not requiring Authorization. He subsequently developed monitoring programs that DFO used to determine the effectiveness of the operational statements. For OWA and DFO Dr. Kilgour (with staff) developed mitigations for a variety of in-water works activities including dewatering, site isolation, moorings, coffer dam installation, in-water repair, bridge construction, culvert installation, shoreline stabilization and dredging. For DFO, Dr. Kilgour developed a mitigation costing manual for fish habitat, and subsequently for species at risk fishes. He has developed site-specific mitigations (timing windows and habitat enhancement) to offset effects of dam redevelopment on Lake Sturgeon and Walleye spawning habitat. Dr. Kilgour is well experienced in the development of effects monitoring, having worked with numerous federal and provincial agencies in the design and implementation of aquatic environment monitoring programs focuses on water quality, sediment quality, benthos and fish. Specifically, he developed guidance documents that described the technical methods for conducting environmental effects monitoring for the pulp and paper sector, for Fisheries and Oceans Canada. He subsequently supported Environment Canada in variable capacities in the design and development of the environmental effects monitoring program for the metal mining sector. He was contracted by Environment Canada to describe the relationship between predictions in environmental assessment and effects monitoring, which was published (*Env Mon Ass* 130:423-436). He has been active across Canada in the design of environmental effects monitoring programs assessing effects related to pulp mills (with hydroelectric facilities), metal mines, offshore oil and gas, oil sands, and coal mining. He is currently the Independent Scientist for the Elk Valley Environmental Monitoring Committee, which is responsible for oversight of monitoring of the effects of five coal mines in the Elk Valley of the interior of British Columbia. He has been retained on numerous occasions to review the designs and interpretations (as an independent reviewer) of effects monitoring programs for pulp mills and diamond mines.



Ecological Flows

Dr. Kilgour was retained by Fisheries and Oceans Canada to review use and status of instream flow needs methods in Ontario, with specific reference to hydroelectric development (Kilgour et al., Can Man Rpt Fish Aq Sc 2723; http://publications.gc.ca/collections/collection_2007/dfompo/Fs97-4-2723E.pdf). Dr. Kilgour subsequently determined ecological flow needs for Lake Sturgeon on the Spanish River downstream of hydroelectric facilities at Espanola Falls and at Nairn Falls, and flow needs for Walleye downstream of Espanola Falls, Nairn Falls and High Falls. The flow needs assessments for sturgeon and Walleye were carried out using two-dimensional hydrodynamic modeling integrated with habitat suitability models.

Expertise and Experience in the hydroelectric sector

Dr. Kilgour has conducted baseline studies and assessments for a variety of hydroelectric facilities in Ontario and elsewhere. He participated in the analysis of baseline studies for the Churchill Fall project in NL. He was contracted by Ontario Ministry of Natural Resources (1999) to review technical reports describing effects of hydropower. He has led or participated in environmental assessments for the following dam removals, upgrades or replacements: (1) Laniel Dam replacement; (2) Latchford Dam removal; (3) Yellow Falls design and construction; (4) Lorne Falls GS bypass upgrade; (5) Nairn Falls GS replacement. For those projects he has led studies documenting water quality, sediment quality, benthic invertebrates, fish communities and populations, mercury levels in sportfish, fish habitat suitability, and species at risk (birds, bats, fish, turtles). He has monitored tissue mercury levels in sportfish on the White River, Vermilion River and Spanish River in relation to existing waterpower structures. He has monitored and modeled mercury levels for a proposed water management structure on Ethel Lake near Sudbury.

Bruce Kilgour, PhD

President

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Attachments: Curriculum Vitae





Dr. Kilgour is a biologist, with a background in monitoring, study design, ecological inventory, and biological / environmental statistics. With 25+ years of experience, he has worked with federal, provincial and municipal governments in developing and designing aquatic environment monitoring programs. As a field biologist, he has worked with offshore oil and gas, oil sands, metal mining, and pulp & paper companies design and implement monitoring programs in freshwater streams, rivers and lakes, and for coastal environments. He has worked across Canada including in every Province, and in two Territories. He has peer-reviewed monitoring programs for the federal government (Fisheries and Oceans), Conservation Authorities, Water Boards, and for the Mining Association of Canada. He has worked with Environment Canada on several assignments related to the development of protocols for deriving water quality guidelines, and approaches for interpreting metals concentration data. He has published more than 40 papers in peer-reviewed journals related to the design of monitoring programs, Canada's Water Quality Index, and statistical approaches to testing for change in environmental media. He has been qualified as an expert witness and provided testimony in the ecotoxicology of metals, and as a fisheries biologist.

EDUCATION

BSc, University of Guelph, Fisheries Biology,
Guelph, Ontario, 1986

MSc, University of Guelph, Aquatic Science,
Guelph, Ontario, 1989

PhD, University of Waterloo, Aquatic Biology,
Waterloo, Ontario, 1997

RECENT TRAINING AND COURSES

Working at Heights, January, 2017

CPR and First Aid, July, 2014

Canadian Water Quality Guidelines derivation procedure. Course provided by Environment Canada, Toronto, February 2007

Biotic Ligand Model. Course provided by the Society of Environmental Toxicology and Chemistry, Burlington, March 2006.

Swift Water Rescue, July 2017

WHMIS

PROFESSIONAL ASSOCIATIONS

Society of Environmental Toxicology and Chemistry (Member)

EMPLOYMENT HISTORY

Kilgour & Associates, Ottawa, ON, President (2008 to present)

Stantec Consulting, Ottawa, ON, Senior Consultant (2005 to 2008)

Jacques Whitford, Ottawa, ON, Senior Consultant (2000 to 2005)

Water Systems Analysts, Guelph, ON, Principal, (1992 to 2000)

RELEVANT PROJECT EXPERIENCE

Peer Review

Third party peer review of the Lac De Gras aquatic environmental effects monitoring study design and first cycle of monitoring results on behalf of the Wek'eezhi Land and Water Board.

Third party peer review of the proposed Northern Pulp mill effluent treatment facility Focus Report and associated supporting documents.

Independent Scientist on the Environmental Monitoring Committee for Teck Coal's Environmental Management Permit for five mines in the Elk Valley BC. Reviewing various reports and studies associated with human health risk assessment, groundwater quality, surface water quality, sediment quality, aquatic organisms, aquatic dependent wildlife.

Technical peer reviewer for several journals including Environmental Toxicology and Chemistry, Environmental Science and Technology, Integrated Environmental Assessment and Management.

Waterpower

Baseline benthic community and water quality studies for the Churchill River, NF. (with Jacques Whitford, 1999)

Development impacts in the Moose River Basin, Classification, Data Gaps, and Management Needs. Report to Ontario Ministry of Natural Resources. Report included assessment of hydroelectric effects. (with C. Portt and Associates, 1999)

Fish habitat study of the Kipawa River downstream of the Laniel Dam, QC, Public Works and Government Services Canada

Yellow Falls Hydroelectric Project, environmental assessment, fish habitat assessment and compensation design, Canadian Hydro Developers (with Stantec)

Scoping Study for Latchford Dam Removal, Public Works and Government Services Canada (with Jacques Whitford)

Spanish River studies. Studies of Lake Sturgeon and Walleye, Whip-poor-will, Blanding's Turtles and SAR bats in the vicinity of four hydroelectric facilities on the Spanish and Vermilion Rivers, near Sudbury.

Assessment of Lake Sturgeon movements and distribution downstream of the Espanola Falls generating station using radio telemetry. For Domtar, 2016.

Nairn Falls replacement generating station, fish and fish habitat mitigations. For Vale Canada Ltd., 2020.

Mercury monitoring in Walleye, Northern Pike and Yellow Perch populations of the White River downstream of the Umbatta Falls GS, for Innergex (2018).

Mercury monitoring in Walleye populations of the Vermilion River downstream of the Lorne Falls GS.

Mercury monitoring in Walleye populations of the Spanish River downstream of the High Falls GS and Nairn Falls GS.

Mercury monitoring and modeling in Northern Pike for a proposed water level management structure on Ethel Lake, Sudbury.

Large-Area Assessments

Elk Valley Environmental Monitoring Committee Member (2015 to present). Dr. Kilgour is the "Independent Scientist" on this committee which provides oversight on Teck Coal's activities under an Area-Wide Permit (BC MOE) to operate five coal mines affecting tributaries to the Elk River (BC). In his role, he reviews and provides advice related to studies designs and reports related to monitoring of fish, benthos, amphibians, birds, water and sediment chemistry and groundwater chemistry in and around the Elk River and the Koochanusa Reservoir, in addition to the ongoing human health risk characterization, the development of an Adaptive Management Plan, and a Third-Party Audit.

Port Colborne Human Health and Ecological Risk Assessment. Dr. Kilgour (with Jacques Whitford) was an environmental scientist working on various aspects of this area-wide risk human health and ecological assessment. He was more intimately involved in the ecological risk assessment, engaged in the design of studies for characterizing ecological exposures. He worked with the study team to characterize environmental exposures.

Vale (Sudbury) Water Quality Management Plan. Dr. Kilgour was a member of a senior consulting team providing advice to Vale's environment department in Sudbury. Vale was developing a water quality management plan, to address liabilities associated with various historical operations in the Sudbury basin.

Moira River Study. Dr. Kilgour was the principal investigator responsible for developing the scope of work for the Moira River human health and ecological risk assessment on behalf of the Ontario Ministry of the Environment. The main issue in the Moira River has been arsenic contamination from the historical Deloro Gold Mine.

Lower Athabasca River. Dr. Kilgour worked alongside Hatfield Consultants between 2002 and 2015 in the delivery of the Regional Aquatics Monitoring Program (RAMP), a monitoring program (fish, benthos, sediment water) that characterized environmental quality in the Athabasca River in the vicinity of oil sands operations. Dr. Kilgour has since been retained by the Alberta Energy Regulator, and Canada's Oil Sands Innovation Alliance to develop frameworks for the assessment of ecological monitoring data.

Statistical Expertise

Taught undergraduate biostatistics at The University of Western Ontario, 1998

Retained by University of Saskatchewan to create course material for undergraduate statistics course, 2008

Retained by Environment Canada to develop scripts for automating the analysis of fish population data. This was in support of the federal Environmental Effects Monitoring office. 2005.

Retained by Environment Canada's federal EEM office to develop a methodology to compute standardized effect sizes for fish population endpoints, when the analysis includes covariables such as fish length, weight or age. 2007.

Multiple papers in peer-reviewed journals relating to development and demonstration of statistical procedures in biological applications (*Écoscience*, 5:542-550; *IEAM* 13:188-197, 14:444-446; 14:552-566).

Expert Witness & Testimony

Qualified as an expert witness in "*aquatic ecology, ecotoxicology and the assessment of aquatic effects of metals, including nickel*", in front of the Ontario Court of Justice in the case between Her Majesty the Queen and Inco Limited, R. v. Inco Limited, 2008, ONCJ 332

Qualified as an expert witness in "*fisheries science and ecological risk assessment as it relates to fish*" in front of the Environmental Review Tribunal in Case 14-007, Van Den Bosch vs NextEra.

Government Science Policy

Review and review of the City of Ottawa setback policy for watercourses, City of Ottawa

White Paper defining Medium Risks to fish and fish habitat that can be authorized using a streamlined authorization process, Department of Fisheries and Oceans Canada, Ottawa

Monitoring program design for assessing the effectiveness of Operational Statements to protect fish and fish habitat, Department of Fisheries and Oceans, Burlington/Winnipeg

Habitat mitigation and restoration costing guides, Department of Fisheries and Oceans Canada, Ottawa/Vancouver.

Risk Final Report on the Review of Progress on the Code of Practice for Road Salts, Environmental Component, Environment Canada

Evaluation of the Sensitivity of the Canadian Water Quality Index, Canadian Council of Ministers of the Environment (CCME)

Peer Review of the Synthesis Reports for the National Agri-Environmental Standards Initiative, Environment Canada

Development of an Approach to Evaluating the Ecological Benefits of Implementing the Code of Practice for Road Salts, Environment Canada

Development of recommended biological assessment program for municipal wastewaters, Environment Canada

Review of aquatic habitat classification approaches, Fisheries and Oceans Canada

Monitoring Programs for Northern National Parks, Parks Canada

Review of Policies and Methods for Evaluating In-stream Flow Needs for Surface Waters, Environment Canada

Review of the Natural Flow Paradigm, Ontario Power Generation

Risk Framework for Evaluating the Potential Impacts Associated with Hydroelectric Developments on Fish and Fish Habitat, Fisheries and Oceans Canada

Framework for Assessing Aquatic Ecosystem Health, Alberta Environment

Identification and collection of nutrient and biological data for Canadian surface waters, Environment Canada, National Agri-Environmental Standards Initiative

Alternative Approaches to Deriving Provincial Water Quality Objectives (PWQOs) using Background Water Quality Data, Ontario Ministry of the Environment

Development of Nutrient Standards for Streams Draining Agricultural Land Uses, Environment Canada, National Agri-Environmental Standards Initiative

Case Study Analysis for Impacted, Flowing Water Bodies for the CCME National Water Quality Index, Environment Canada, Guidelines Division

Revision of the CCME derivation protocol for water quality guidelines, Environment Canada, Guidelines Division

Evaluation of Policies from Leading Jurisdictions for the Protection of Surface Water Quality on a Watershed Basis, Ontario Ministry of the Environment

Review of Sublethal Toxicity Tests for use in Environmental Effects Monitoring, Natural Resources Canada

Development of Conversion Factors between Total and Dissolved Metals in Surface Waters, Environment Canada

Definition of Pronounced Eutrophication as it pertains to the Pulp & Paper Environment Environmental Effects Monitoring Program, Environment Canada, EEM Office

Classification System for Contaminated Aquatic Sites, Transport Canada

Upland Influences on Aquatic Habitat, Canadian Wildlife Service

White paper on the use of environmental effects monitoring within environmental assessment, for Environment Canada, Environmental Effects Monitoring Office

White paper on statistics for determining the magnitude of effect in environmental effects monitoring, for Environment Canada, Environmental Effects Monitoring Office

Development of an approach to estimate effect sizes for regression endpoints in adult fish surveys, for Environment Canada, Environmental Effects Monitoring Office

Review and development of environmental quality objectives for application to the municipal wastewater sector, for Environment Canada, Environmental Effects Monitoring Office

Meta analysis of environmental effects monitoring data for the pulp & paper sector, for Environment Canada, Environmental Effects Monitoring Office

White paper, "Understanding the Pulp and Paper Environmental Effects Monitoring Program", for Environment Canada, Environmental Effects Monitoring

Work in the Nuclear Sector

Review of Cooling Water Intake Designs at Nuclear Power Plants in Ontario (Pickering, Bruce), as it pertained to fisheries losses. Review completed for Fisheries and Oceans Canada, Burlington, 2009.

Provision of expert advice in support of the Beaverlodge Lake Tailings Management Area, Canadian Nuclear Safety Commission Re-Licence, For Canada Eldor.

McClellan Lake Environmental Studies. Provided advice regarding study design of environmental effects monitoring programs from 2008 to 2018, including programs involved in the monitoring of water and sediment quality, benthos and fish populations. For AREVA Canada Ltd. (now ORANO).

Completed an evaluation of the potential uses of a reference condition approach for benthos community surveys for lakes in Northern Saskatchewan. Evaluation was completed for the Canadian Nuclear Safety Commission in 2009 and resulted in a peer-reviewed paper (CWRJ 43:305-320).

Environmental Effects Monitoring (EEM)

Mining

Vale: Totten Mine, Worthington ON. Initial, Confirmation, Extent and Investigation of Cause Monitoring.

Vale (Inco): Thompson, MB. Initial Monitoring.

Vale: Crean Hill Mine, Worthington, ON. Initial and Confirmation Monitoring.

Vale: Junction Creek, Sudbury, ON. Initial, Confirmation, Investigation of Cause.

Glencore: Sudbury Smelter, Falconbridge, ON. Confirmation Monitoring, and Investigation of Cause

Glencore: Strathcona Mill, Onaping, ON. Routine monitoring.

Orano Canada: McLean Lake, SK, Initial, Confirmation, Investigation of Cause and Routine Monitoring.

Agnico-Eagle: Meadowbank Mine, NU, Confirmation Monitoring, benthos component (with C. Portt and Associates).

KGHM: Victoria Mine, Worthington, ON, baseline monitoring.

SSR Mining: Seabee Mine, Investigation of Cause, and Routine Monitoring, Laonil Lake, SK.

Clavos Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Sangold Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Liberty Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Holloway Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Wesdome Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Hislop Mine, Timmins, ON. Initial Monitoring (with Parks Environmental).

Review of Diavik's Aquatic Effects Monitoring Program for Lac de Gras, NWT, Wek' eezii Land and Water Board

Oil and Gas

Development of tiers and triggers framework for regional monitoring, developed for Canada's Oil Sands Innovation Alliance, 2017.

Framework for integrating cumulative effects monitoring and management, as it applies to oil sands operations, for Canada's Oil Sands Innovation Alliance, 2018.

Water quality triggers for oil sands monitoring, report to Alberta Environment and Parks, 2019.

Framework for integrating monitoring with tiers and triggers, for Alberta Energy Regulatory, 2016.

Regional Aquatics Monitoring Program, benthic invertebrate community component lead from 2003 to 2013. (with Hatfield Consultants)

Joint Oil Sands Monitoring Plan, aquatic environment monitoring program, benthic invertebrate community component lead (2014) (with Hatfield Consultants).

Sediment Quality Triad Study, Athabasca River, Suncor

Terra Nova Offshore Drilling, monitoring program, data analyst from 2012 to 2014.

White Rose Offshore Drilling, monitoring program, data analyst from 2010 to 2012.

Pulp and Paper

Abitibi: Stora, Fraser, Thurso, Spruce Falls, Masson, Mallette, St. Marys, all cycle 1 (all with BAR Environmental). Grand Falls, NF; Stephenville, ON; Kenora, ON; Fort Frances, ON; Thunder Bay, ON; Thorold, ON; Iroquois Falls, ON. Cycles 1, 2 and 3 for each facility (all with C. Portt and Associates). Fort Frances, ON Cycle 4 (with C. Portt and Associates).

Smurfit-Stone: Thunder Bay, ON Cycle 2 (with Jaques Whitford).

Irving Paper, Courtenay Bay, Lake Utopia, Minas Basin, St. John River, Cycle 1 for each facility. (all with Washburn Gillis and Associates).

Slave Lake Pulp and Paper, Lesser Slave River, AB, baseline studies (with EVS Consultants).

Municipal Wastewater

Benthic invertebrate study in the vicinity of the Guelph sewage treatment plant on the Speed River, Grand River Conservation Authority

Pollution prevention plan and environmental effects monitoring of the City of Ottawa sewage treatment plant, City of Ottawa.

Benthic invertebrate study in the vicinity of the Guelph sewage treatment plant on the Speed River, Grand River Conservation Authority

Water & Sediment Quality Assessments (non-EEM)

Water quality monitoring of Lake Heney, QC, 2016 and 2017. Heney Lake Foundation, QC.

Development of normal ranges for water quality, benthos and fish population measures, Lower Athabasca River, for Canada's Oil Sands Innovation Alliance (COSIA, Calgary, AB.

Ramsey Lake Subwatershed Study, Sudbury, ON.

Whitewater Lake Subwatershed Study, Sudbury, ON

Whitson River Subwatershed Study, Sudbury, ON.

Examination of spatial and temporal variations in groundwater chemistry and toxicology for Albian Sands, oil sands mine sites, Shell Canada, Calgary.

Review of Credit Valley Conservation Authority's 10-Year Watershed Monitoring Program.

Updating toxicity information of chemical parameters for aquatic vertebrates, invertebrates and plants, Ontario Ministry of the Environment, Guidelines Division

St. Clair River Benthic Study, Ontario Power Generation

Benthic invertebrate studies in the vicinity of Fighting Island on the Detroit River, BASF

Assessment of benthic communities in the Grand River and correlates of composition, Grand River Conservation Authority

Validation of lake acidification models, Fisheries and Oceans Canada

Review of Danish EPA risk assessment of aquatic effects of nickel, Inco.

Assessment of data from the aquatic monitoring program for Swift Current Creek, City of Swift Current

St. Marys River water, sediment and biological inventories, Ontario Ministry of the Environment

Lake Simcoe, water, sediment and biological inventories, Lake Simcoe Region Conservation Authority

Lake Couchiching, water, sediment and biological inventories, Ontario Ministry of the Environment

Baseline environmental studies, Voisey's Bay Mine Site, Voisey's Bay Nickel Corporation

Review of Cluff Lake (SK) environmental studies, AQUAMIN Secretariat

Assessment of water and sediment quality, Contwoyto Lake, Environment Canada

Lake Ontario nearshore benthic, water and sediment survey, Ontario Ministry of the Environment

Provision of statistical advice for the Sudbury Area Risk Assessment, Inco

Ecological risk assessment of metals discharging from Pickering and Nanticoke generating stations, Ontario Hydro

Fish Habitat Assessment and Restoration

Carp River Restoration Plan, City of Ottawa (with AECOM)

Todd Channel (Ottawa) design, permitting and construction monitoring, Barrhaven South Owners Group

Clarke Drain (Ottawa) design and permitting, Barrhaven South Owners Group

Hazeldean Creek realignment, design, permitting and construction monitoring, Kanata West Owners Group (with Stantec).

Fish habitat risk assessment, Van Gaal Drain and Jock River (Ottawa), Mattamy Homes

East Urban Community fish and fish habitat risk assessment, for the City of Ottawa.

Highland Creek Valley Segment 4a Study, Design and Environmental Assessment, City of Toronto (with Parish Geomorphic and AECOM)

Taylor Massey Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Berry Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Duncan Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Sydenham River Recovery Plan, Synthesis Document, Ontario Ministry of Natural Resources

Fisheries Study of the Ottawa River in the Vicinity of the Proposed Canadian War Museum at Lebreton Flats, Public Works and Government Services Canada

Fish Community and Fish Habitat Study on the Pickering Lands, Toronto Airport Authority (with Jacques Whitford)

Silent Lake Fish Habitat Assessment, Ontario Ministry of Natural Resources (with Jacques Whitford)

Bioregional Modeling of the Relationship between Fish Communities and Landscape Attributes In Drainages to Lake Ontario, with Emphasis on the Oak Ridges Moraine, Toronto and Region Conservation Authority

Burlington Pier, Municipal Class Environmental Assessment, City of Burlington (with Totten Sims Hubicki)

Ottawa River fish habitat assessment in the vicinity of the proposed War Museum (with Jacques Whitford)

Natural Environment Investigations

Jock River Studies. Studies of Walleye, Northern Pike, Muskellunge, breeding birds, and Blanding's Turtles in the vicinity of proposed land developments along a 4 km reach of the Jock River in Ottawa.

Mahogany Woods natural area assessment of migratory birds, species at risk (Butternut, bats), and significant woodlands. Minto Communities, Ottawa

Assessment of species at risk associated with Victoria Mine site near Sudbury. KGHM International, Sudbury.

Duncan Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Berry Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Taylor Massey Creek restoration design and assessment, City of Toronto (with Parish Geomorphic and AECOM)

Shields Creek Subwatershed Study, City of Ottawa (with Jacques Whitford)

Victoria Islands Natural Environment Inventory, National Capital Commission (with Jacques Whitford)

Mattamy Richmond Lands Natural Environment Inventory, Mattamy Homes.

Permits and Approvals

Beaverlodge Lake Tailings Management Area, Canadian Nuclear Safety Commission Re-Licence, Canada Eldor (with McCarthy Tetreault)

Peterborough Municipal Airport Runway Extension, Federal Screening-Level Environmental Assessment, and supporting natural environment

studies (for City of Peterborough, with Bolivar-Philips)

Totten Mine Ontario Ministry Certificate of Approval, Inco Limited (with McCarthy Tetreault)

Island Falls Provincial Environmental Assessment, Canadian Hydro Developers (with Stantec)

Carp River Restoration Fish Habitat Compensation Plan, City of Ottawa (with Stantec)

Barrhaven South Fish Habitat Compensation Plan, Barrhaven South Owners Group (with Stantec)

Burlington Pier, Municipal Class Environmental Assessment, City of Burlington (with Totten Sims Hubicki)

Highland Creek Restoration, Federal CEAA Screening, for City of Toronto (with Parish Geomorphic)

Berry Creek Restoration, Federal CEAA Screening, for City of Toronto (with Parish Geomorphic)

Duncan Creek Restoration, Federal CEAA Screening, for City of Toronto (with AECOM)

Taylor Massey Creek Restoration, Federal CEAA Screening, for City of Toronto (with Parish Geomorphic)

Strategic Environmental Assessment (SEA) of the National Divestiture Program (Project Manager).

Findlay Creek Development, Federal Environmental CEAA Screening, Fisheries and Oceans Canada (with Jacques Whitford)

Nordic Circle Shoreline Stabilization and Restoration, Federal CEAA Screening, National Capital Commission (with Jacques Whitford)

Comprehensive Environmental Assessment of Irving Oil's liquified natural gas (LNG) port and pipeline in Saint John, NB. (with Jacques Whitford)

Scoping Study for Latchford Dam Removal, Public Works and Government Services Canada (with Jacques Whitford)

Laniel Dam Replacement, Federal CEAA Screening, Public Works and Government Services Canada (with Jacques Whitford).

PEER-REVIEWED PUBLICATIONS

Somers, K.M., B.W. Kilgour and K.R. Munkittrick. 2019. Can statistical analyses account for the effect of interrelatedness in assessments using multiple environmental parameters? Integrated Environmental Assessment and Management, 15:662-664.

Kilgour, B.W., K.R. Munkittrick, L. Hamilton, C. Proulx, K. Somers, T. Arciszewski, M. McMaster. 2019. Developing Triggers for Environmental Effects Monitoring Programs for Trout-perch in the

Lower Athabasca River. *Environmental Toxicology and Chemistry*, 38:1890-1901.

Kilgour, B.W., A. Mahaffey, S. Hughes, C. Brown, C. Hatry, L. Hamilton. 2019. Variations in toxicity and ecological risks associated with some oil sands groundwaters. *Science of the Total Environment*, doi.org/10.1016/j.scitotenv.2018.12.287.

Breckels, R. and B.W. Kilgour. 2018. Aquatic herbicide applications for the control of aquatic plants in Canada: effects to non-target aquatic organisms. *Environmental Reviews*, 26(3):333-338. doi.org/10.1139/er-2018-0002.

Arciszewski, T.J., R.R. Hazewinkel, K.R. Munkittrick and B.W. Kilgour. 2018. Developing and applying control charts to detect changes in water chemistry parameters measured in the Athabasca River near the oil sands: A tool for surveillance monitoring. *Environmental Toxicology and Chemistry*, 37(9)2296-2311.

Somers, K.M., B.W. Kilgour, K.R. Munkittrick and T.J. Arciszewski. 2018. An adaptive environmental effects monitoring framework for assessing the influences of liquid effluents on benthos, water and sediments in aquatic receiving environments. *Integrated Environmental Assessment and Management*, 14:552-566.

Kilgour, B.W., B. Dowsley, M. McKee, S. Mihok. 2018. Effects of uranium mining and milling on benthic invertebrate communities in the Athabasca Basin of Northern Saskatchewan. In Press, *Canadian Water Resources Journal*, 43:305-320.

Hughes, S.A., A. Mahaffey, H. Bailey, B. Shore, J. Baker, B. Kilgour, C. Brown, K.M. Peru and J.V. Headley. 2017. Using ultrahigh-resolution mass spectrometry and toxicity identification techniques to characterize the toxicity of oil sands process-affect water: the case for classical naphthenic acids. *Environmental Toxicology and Chemistry*, 36:3148-3157.

Kilgour, B.W. and K.M. Somers. 2017. Challenges with the use of normal ranges in environmental monitoring. *Integrated Environmental Assessment and Management*, 13:444-446.

Kilgour, B.W., K. Somers, T.J. Barrett, K.R. Munkittrick and A. Francis. 2017. Testing against 'normal' with environmental data. *Integrated Environmental Assessment and Management*, 13:188-197.

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