



Statement of Qualifications

Upper's Quarry, Niagara: Level 1 and
Level 2 Natural Environment Technical
Report and Environmental Impact Study
(October 29, 2021)

February 3, 2022

File: 160961352

Prepared for:
Walker Aggregates Inc.

Prepared by:
Stantec Consulting Ltd.



DANIEL EUSEBI
Senior Environmental Planner

Daniel Eusebi BES, MCIP, RPP

Senior Environmental Planner
34 years of experience · Waterloo, Ontario

Daniel Eusebi is a Senior Environmental Planner in Ontario with a broad range of expertise in the environmental field, gained over a 30+ year career. He specializes in natural science based assessments, evaluation of significance and environmental impact analyses, coordinating teams of multidisciplinary professionals. Daniel's experience and expertise in the environmental field allow him to assess overall environmental impacts of a variety of scenarios and provide appropriate mitigation options where feasible. He is skilled at coordinating various project stakeholders and negotiating with regulatory agencies concerning project permits and approvals. He manages the public consultation phase for high profile projects and has provided testimony as an Expert Witness at the OMB.

Daniel's practical experience includes natural science based environmental assessments [flora, fauna and aquatics, often involving species at risk (SAR)], site decommissioning and redevelopment, design and implementation of protection techniques for development sites and linear facilities, and rehabilitation and restoration of natural areas, as well as compliance monitoring.

Daniel is involved in numerous development projects, which include regulatory approvals, evaluation of significance of natural heritage features and impact analysis, as well as Adaptive Management Planning (AMP). This experience is facilitated by his strong familiarity with provincial and municipal policies and regulatory requirements as they relate to natural heritage features. In southern Ontario he oversees and directs community development projects (site analysis, impact assessment, and senior report review).

EDUCATION

BES (Honours), Major in Environmental and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada, 1988

CERTIFICATIONS & TRAINING

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC) System for Southern Ontario, Turkey Point, Ontario, Canada, 2011

Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), North Bay, Ontario, Canada, 2009

MEMBERSHIPS

Certified Member, Canadian Institute of Planners

Member, Environment Committee, Ontario Stone, Sand & Gravel Association

Registered Professional Planner, Ontario Professional Planners Institute

PROJECT EXPERIENCE

CEMENT / AGGREGATES

Levels 1 & 2 Natural Environment Technical Assessment Report for Proposed Olszowka Aggregate Application, CBM Aggregates | Brant County, Ontario | Project Manager

Managed natural environment studies for development of proposed 140 hectare pit proposed by CBM Aggregates in Brant County. Management included natural environment surveys including species at risk. In addition the project involved engaging in stakeholder consultation with both public and private sectors including the presentation of the project during public information sessions. Extensive MNRF consultation was undertaken in response to species at risk on site. An Overall Benefit plan was developed in consultation with the MNRF for an ESA Authorization application.

Olszowka Aggregate Pit Species at Risk Authorization | CBM Aggregates | Project Manager

Developed a detailed mitigation and Overall Benefit plan for Blanding's Turtle Species at Risk for authorization under the Endangered Species Act.

Levels 1 & 2 Natural Environment Technical Assessment Report, Proposed Bromberg Aggregate Application | CBM Aggregates | Township of North Dumfries, Ontario | 2013 | Senior Environmental Planner

Coordinated preparation of Levels 1 & 2 Natural Environment Technical Assessment Report for the proposed Bromberg Pit. Served as an Expert Witness at the Ontario Municipal Board (OMB)

Natural Environment Level 2 Technical Reports and Site Plans for Aggregate Pits S1, S4 and T2 | Greenstone Gold Mines | Geraldton, Ontario | Project Manager / Senior Environmental Planner

Managed and coordinated the preparation of three aggregate reports and associated site plans to support the development of the Greenstone Gold Mine in Geraldton Ontario

Level 2 Natural Environment Technical Report, Maaskant Property, Lavis Contracting Co. Ltd | Clinton, Ontario | Environmental Planner and Director

Peer Review: Natural Environment Report for the Proposed Category 4 – Class A – Above Water Rockridge Quarry | County of Peterborough | Municipality of Trent Lakes, Ontario | 2019 | Senior Environmental Planner

Stantec was retained by the County of Peterborough to conduct peer reviews of various technical studies in support of an Aggregate Resources Act application for a proposed limestone quarry at 110 County Road, Highway 507 (Lot 21, Concession 8 Municipality of Trent Lakes, County of Peterborough). For this assignment, Daniel reviewed the Natural Environment Level 1 & Level 2 Technical Reports prepared by NEA Inc. (2018) and associated background studies

Dufferin Aggregates Acton Quarry Extension Natural Environment Studies | Dufferin Aggregates | Acton, Ontario, Canada | Natural Environment Manager

The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. The area of focus encompasses approximately 615 ha, across two Conservation Authority watersheds within the Regional Municipality of Halton Hills. Daniel coordinated natural environment baseline studies for terrestrial plant and wildlife species. These studies were used to define the extraction footprint and design mitigation strategies, including monitoring and adaptive management planning

Levels 1 & 2 Natural Environment Technical Report and Environmental Impact Study for Proposed Simpson Lake Quarry, Coloured Aggregates | Coloured Aggregates | Bancroft, Ontario | 2012-present | Environmental Planner

Peer Review: Natural Environment Level 1 and 2 Technical Report for Proposed Category 8 - Class B Quarry (Above Water) East Half Lot 1, Concession 3 (Geographic Township of Galway) Peterborough County | Ontario | 2011 | Environmental Planner

Peer Review: Scoped EIS for Dewdney Mountain Farms Ltd. Severance Application B75-11, Lots 28-32, Concession 15, Township of Galway-Cavendish Harvey, County of Peterborough | Ontario | 2011 | Environmental Planner

Level 2 Natural Environment Technical Assessment Report for Aggregate Expansion, Hillsburgh Pit, CBM Aggregates | Erin, Ontario | 2008 | Environmental Planner, Project Manager

Duntroon Quarry Application Adaptive Management Plan (AMP), Walker Industries | Collingwood, Ontario | Environmental Planner

Adaptive Management Plan, Nelson Aggregate Co. | Burlington, Ontario | Environmental Planner

Landscape and Ecosystem Restoration Plan, Nelson Aggregate Co. | Burlington, Ontario | Environmental Planner

Level 2 Natural Environment Technical Report, Nelson Aggregate Co. | Burlington, Ontario | Environmental Planner

Levels 1 & 2 Natural Environmental Technical Assessment Report for Proposed Aggregate Application, Montrose Pit, Capital Paving | County of Wellington, Ontario | Environmental Planner

Levels 1 & 2 Natural Environment Technical Assessment Report for Proposed Aggregate Application, Godfrey Extension, CBM Aggregates | Peterborough County, Ontario | Environmental Planner

Levels 1 & 2 Natural Environment Assessment, Holman Pit | Guelph Eramosa Township, Ontario | Environmental Planner

Level 2 Natural Environmental Assessment Technical Report, Capital Paving | Aikensville, Ontario | Environmental Manager

Level 2 Natural Environmental Assessment Technical Report Aggregate Application | Region of Halton, City of Burlington, Ontario | Environmental Coordinator

Level 2 Natural Environmental and Aquatic Assessment - Aggregate Quarry Application, Federal White Cement | Oxford County, Ontario | Project Manager

Environmental Impact Study Report Aggregate Application | Flamborough, Ontario | Project Coordinator

Level 2 Natural Environment Technical Report, Spencer Pit, Tri City Lands Limited | Guelph, Ontario | Environmental Director

ENVIRONMENTAL PLANNING

Environmental Impact Study, 781 Victoria Road Rezoning Application | Guelph, Ontario | 2008-2015 | Senior Environmental Planner

Coordinated preparation of the EIS and draft EIR for the site, conducted agency liaison and made presentations before the Environmental Advisory Committee (EAC). Served as an Expert Witness at the Ontario Municipal Board (OMB)

Metrolinx Stouffville Grade Separations | Natural Environment Manager

Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum

Metrolinx Scarborough Junction and Grade Separation | Natural Environment Manager

Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum

Metrolinx Lincolnville Go Station Existing Conditions Report | Metrolinx | Ecosystem Project Manager and ESA Management

Managed the natural environment studies for the Lincolnville Go Station site. Coordinate the field studies and wetland evaluation with MNR. Assessed wetland impacts and Species at Risk habitat including development of SAR mitigation plans for Barn Swallow and bats. Provide design input for vegetation buffers species at risk habitat and wildlife crossings

Enbridge Gas Distribution Inc. GTA Project, Greater Toronto Area (GTA) Pipeline | Enbridge Gas Distribution Inc. | Ontario | 2014-present | Environmental Permit and Approval Manager and Acquisition Coordinator

Responsible for coordinating acquisition of environmental permits and approvals from regulatory agencies for pipeline installation works, including MOECC, MNR, conservation authorities and municipalities

Enbridge Gas Distribution Inc. GTA Project | Enbridge Gas Distribution Inc. | Greater Toronto Area Pipeline, Ontario | 2014-present | Project Manager

Construction inspection and compliance manager, environment. Responsible for the management of environmental discipline inspection and monitoring during construction. Disciplines managed include hydrology, archaeology, air, noise, vibration, environmental rehabilitation, restoration planting, wildlife, vegetation, and aquatic. Responsible for coordinating and managing health and safety requirements for environmental services and geotechnical disciplines

Hybridine Solar Farm | Municipality of Clarington, Ontario | Environmental Planner

Stantec was retained to complete a REA submission to the MOECC for a proposed 2 MW solar farm project on behalf of EDF. Daniel managed and coordinated information for the natural heritage lead for the NHA/EIS, completed consultation with MNR regarding background data collection and natural heritage surveys. Assessed wetland and significant wildlife habitat at the site and developed mitigation strategies to reduce natural environment impacts from the project

Kortright Subdivision Environmental Impact Study, Victoria Road | Guelph, Ontario | Project Environmental Planner

Victoria Valley Golf Course Environmental Impact Study, Victoria Road South and Maltby Road East | Guelph, Ontario | Project Environmental Planner

Pergola Lands Environmental Impact Study, Gordon Street and Clair Road | Guelph, Ontario | Project Environmental Planner

Dallan Lands Environmental Impact Study, Clair Road | Guelph, Ontario | Project Environmental Planner

Clearview Stables Environmental Impact Study, 1065 Victoria Road South | Guelph, Ontario | Project Environmental Planner

Victoria Park Village, 1159 Victoria Road South | Guelph, Ontario | Project Environmental Planner

NATURAL SCIENCES & HERITAGE RESOURCES

Medway Trunk Sanitary Sewer Crossings | City of London | London, Ontario | 2006 | Project Manager / Environmental Planner

Coordinated preparation of watercrossing plans, including bed-level crossing for the Medway Trunk Sanitary Sewer project. Supporting studies included a Fisheries Habitat Assessment. Medway Creek supports a mollusc SAR (Wavy-rayed Lampmussel) and construction of the project involved mussel relocation and monitoring. Prepared the permits and approval package

Richardson Farms Scoped Environmental Impact Study | Z Group | Ecosystem Project Manager

Assessed and presented the removal and transfer of a portion of Provincial Significant Wetland for approval to the UTRCA in the City of London.

Environmental Impact Study 1250 Gordon Street Guelph | Tricar | Ecosystem Project Manager

Assessed development impacts and identified bat Species at Risk habitat on site.

City of Guelph Development Projects

Senior environmental adviser and quality reviewer for a number of Guelph development projects, including, Blue Water Developments, Victoria Road, Tricar, 1250, 1858 Gordon Street, 71 Wyndam Street and 220 Arkell Road. Dan has directed the EIS and EIR components of the projects as well as the flora and fauna surveys and monitoring undertakings.

Vector Pipeline Project, Vector Pipeline Ltd. | Project Manager

Development of watercrossing technique design for environmental protection. Coordination of regulatory approval requirements

OCWA Water Pipeline at the Ausable River Watercrossing, Ontario Clean Water Agency | Project Manager

Developed and implemented environmental protection methods on-site.

Line Lowering at 403 Burlington - Rambo Creek Crossing, Interprovincial Pipe Line Inc. | Project Manager

Preparation of Sediment Control Plan and Watercrossing Plans

Line 9C, Shell Take off to Sarnia Terminal, Interprovincial Pipe Line Inc. | Project Manager

Preparation of Sediment Control Plan and Watercrossing Plans

Line 9C Sarnia Delivery Line, Enbridge Pipeline Inc. | Project Manager

Development of watercrossing design for protection of water resource

Highway 9 Project, 5 Watercrossings, Consumers Gas | Project Manager

Preparation of Sediment Control Plan and Watercrossing Plans

Consumers Gas Link Project, Baby Creek | Project Manager

Preparation of Sediment Control Plan and Watercrossing Plans

Conceptual Restoration Plans, Smithville and Wolverton Pumping Station, Interprovincial Pipe Line Inc. | Project Manager

ENVIRONMENTAL ASSESSMENTS

Highway 17 Route Planning Study and New Highway 69 Connection, GWP 5031-09-00 | Sudbury to Markstay, Ontario | Natural Environment Planner

Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a route for a future four-lane controlled access Highway 17 between Sudbury and Markstay, including a new Highway 69 connection to the Sudbury Southeast Bypass

Highway 144 Route Planning Study, Northeastern Region GWP 5023-09-00 | Sudbury, Ontario | Natural Environment Planner

Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a future controlled access Highway 144 through the communities of Chelmsford and Dowling in the City of Greater Sudbury. Provided input to Transportation Environmental Study report

Highway 401 Interchange Improvements/Structure Replacements, West Region GWP 3070-09-00 | London, Ontario | Natural Environment Planner

Coordinated collection of baseline data to support preliminary design and environmental assessment for structure replacements and interchange improvements at Highway 401/Westminster Drive (Site 19-366 west of London), Highway 401/Highway 19 (Site 23-210 Ingersoll), and Highway 401/Norwich Avenue (Site 23-170, Woodstock), providing input to the Preliminary Design Transportation Environmental Study reports

Transportation Design, Construction Report and Aquatic Assessment. Highway 3 Road Improvement St. Thomas to Aylmer, Ontario Ministry of Transportation | Environmental Planner

Coordinated and managed the assessment of baseline conditions and natural environment permitting conditions for an MTO highway project. Activities included input to design elements and negotiating permits with the MNR

Transportation Environmental Study Report, Highway 401 Bridge Rehabilitation at County Road 36 and Concession Road 7, Puslinch Township, Wellington County, Ministry of Transportation Ontario (MTO) | Environmental Planner

Fisheries Assessment and Letter of Intent - Highway 3 Improvements/Aquatic Crossings, Ministry of Transportation | Environmental Planner

Environmental Screening Document, Terrestrial and Fisheries Technical Report, Hopewell Creek Bridge Rehabilitation at Highway 7, Ministry of Transportation Ontario (MTO) | Natural Environment Planner

Fox Hollow Subdivision Phase 1 External Sanitary Sewer - Water crossing, permits and approval package | Project Manager

Sithe Goreway Station, Sithe Energies Canadian Development Ltd. | Project Manager

Represented client at public forums

PRISM Pipeline Project | Environmental Permit and Approval Manager and Acquisition Coordinator

Environmental construction permits and approvals for all natural environment features. Work involved assessing natural environment baseline conditions and developing permit packages for crossing of natural environment features and assisting with the development of design mitigation. The pipeline traversed wetland, woodland and watercourse environments.

Agricultural Economic Assessment, Agricultural Assessments of Tom Howe Landfill Site and Canborough Landfill Site | Project Manager

Public Consultation Program for Remediation of Brownfield Site in Residential Neighbourhood, Pirelli Cable Inc | Project Manager

Developed two phase public consultation program for remediation of brownfield site. Presented information and completed individual liaison with affected landowners

NEB Environmental Assessment, Great Lakes Power Ltd. | Project Manager

Coordinated public consultation program for high voltage power cable line – NEB Environmental Assessment. Involved preparation of notifications, presentation materials and establishment of public input database

International Power Line Project - Environmental Site Assessment and Linear Facility Route Selection, Great Lakes Power Ltd. | Environmental Planner

Groundwater Assessment Investigations and Remediation Initiatives for southwestern Ontario Tank Farm and Pumping Station, Enbridge Pipeline Inc. | Project Manager

Fisheries Habitat Assessment, Oshawa/Newcastle proposed Highway 407, Route Location and Environmental Assessment Study | Project Manager

Environmental Property Assessments, Preliminary Phase I Assessment for Contamination Identification, 50 Sites, Canadian National Real Estate Division | Project Manager

Environmental Management System Audit of Enbridge Pipeline Division, Enbridge Pipeline Inc. | Project Manager

Detailed Phase II Investigations for Former Massey Ferguson Brownfield Site, City of Brantford, Ontario | Project Manager

Brownfield Phase I Investigations for 16 Sites in the City of Brantford, City of Brantford | Project Manager

Meyer Pier Park - Risk Assessment Peer Review, City of Belleville, Ontario | Senior Environmental Planner

Sudbury Area Community Risk Assessment - Soil and Groundwater Project Component Assessments, Inco | Planner

Orleans/Gatineau Pipeline Environmental Assessment and Route Selection | Project Manager

Site Remediation Program at Six Remote Fly-in Sites in Northern Ontario, Bell Canada | Site Remediation Program Manager

Conducted preliminary site assessments and coordinated site construction contractors

Peer Review of Environmental Screening Reports and Phase 1 Assessments in South Western Ontario for Property Transactions, Union Gas | Project Manager

Vector Pipeline Project: Phase I and II Property Investigation, Vector Pipeline Ltd. | Project Manager

Nanticoke Junction: Phase I and II Environmental Site Assessment, Enbridge Pipeline Inc. | Project Manager

Peer Review of Phase I and II ESA's for Legal Counsel, Smith Valeriotte, Barristers and Solicitors | Project Manager

Phase I and II Environmental Property Site Assessments | Manager

More than 250 Phase I, and II Environmental Property Site Assessments in Ontario and Quebec for private industry, as well as federal and municipal governments

Natural Science Route Selection Environmental Assessment for Line 9C portion of the Line 9 Reversal Project, Enbridge Pipeline Inc. | Project Manager

Ontario Manitoba Interconnection Project. Data Collection and Regulatory Agency Issue Assessment, Ontario Hydro | Resource Planner

Collected baseline condition information for a proposed Ontario Hydro line connecting Ontario and Manitoba grids. Assessed baseline conditions and provided input to the route selection undertaking

ENVIRONMENTAL SITE MANAGEMENT

St. Clair River Directional Drilling Operations and Regulatory Approvals, Vector Pipelines Ltd. | Project Manager

Development of environmental protection procedures for directional drilling operations of the St. Clair River and coordinated regulatory approval requirements

PRISM Pipeline Project, Imperial Oil Ltd. | Project Manager

Conducted ongoing monitoring and compliance requirements for directional drilling operation at the Grand River

Grand River Crossing at Cambridge, Union Gas | Project Manager

Preparation of Sediment Control Plan and Watercrossing Plans

First Nations Consultation Program and Training Program at Remote Site in Northern Ontario, Bell Canada | Project Manager

Programs involved presenting project remediation information to First Nations groups and providing training for community based employment opportunities

Crude Oil Leak Site, Enbridge Pipeline Inc. | Project Manager

Conducted public liaison in emergency response scenario at crude oil leak site. Maintained ongoing public information liaison with affected landowners

Terrace Pipeline Project, Enbridge Pipeline Inc. | Project Manager/Inspector

Environmental supervision of the directional drill, South Saskatchewan River (1100m drill)

St. Clair River Sediment Quality Sampling Investigations, Vector Pipelines Ltd. | Project Manager

Coordinated sediment quality sampling investigations of the St. Clair River for proposed directional drilling operations

Westover Tank 222 Spill Response, Enbridge Pipeline Inc. | Project Manager

Spill Response and Regulatory Agency Consultation, RCAN Environmental | Project Manager

Line 8 Hydrostatic Testing, Interprovincial Pipe Line Inc. | Project Manager

Coordinated environmental components and developed emergency response program and obtained regulatory approval for Line 8 hydrostatic testing

Emergency Response Management Services - Wolverton Leak Site, Enbridge Pipeline Inc. | Project Manager

Emergency Response Management Services - Bronte Junction Historic Leak Site, Enbridge Pipeline Inc. | Project Manager

Emergency Response Management Services - Binbrook Leak Site (Spill Response and Land Rehabilitation), Enbridge Pipeline Inc. | Project Manager

Emergency and Spill Response Services, Alltech Canada Inc. | Project Manager

Emergency and Spill Response Management, Sarnia Suncor Metering Facility | Project Manager

Clarkson Station - Spill Response and Site Management, Enbridge Pipeline Inc. | Project Manager

Decommissioning of Four Crude Oil Pumping Stations, Interprovincial Pipe Line Inc. | Project Manager

Managed decommissioning of Four Crude Oil Pumping Stations: Keyser, Smithville, Wolverton and Bryanston

Golf Course and Estate Residential Facility, Town of Aurora | Project Manager

Environmental site peer review of mitigation and construction of golf course and estate residential facility

Denso Manufacturing Inc., Guelph Industrial Site Phase I and II Environmental Site Assessment | Project Manager

Phase I and II Environmental Site Assessment and managed site remediation program

Plant Decommissioning and Demolition, Pirelli Cables and Systems Inc. | Guelph, Ontario | Project Manager

Supported identification and removal of PCB containing ballast, site assessment and remediation

Decommissioning of Hydro Electric Transformer Stations, Guelph Hydro | Project Manager

Initiated soil studies and coordinated contracting of site remediation program

Bronte Junction Compound Facility, Enbridge Pipelines Inc. | Project Manager

Remediation and Clean-up site management for the Bronte Junction compound facility

Binbrook Leak Site, Enbridge Pipelines Inc. | Project Manager

Remediation and Clean Up of Binbrook leak site, 600,000 L Crude Oil spill site

Housing Development On-going Site Monitoring, City of Guelph | Project Manager

On-going Site Monitoring of South Creek, Clairfields, Clarington Place and Whitetail Sites

Meadowlily ESA, City of London | Project Manager

Environmental Inspection, Meadowlily ESA, Subdivision development project. Inspection of topsoil stripping, vegetation clearing, erosion and silt control, construction activities, dewatering and rehabilitation monitoring

Line 8 Oil Products Transportation System, Interprovincial Pipe Line Inc. | Project Manager

Coordinated and Conducted Environmental Inspection of Line 8 Construction Program, Southern Ontario

PUBLICATIONS

Unique Features of Environmental Management System/ISO-14001 Application to Linear Facilities. *7th International Symposium on Environmental Concerns in Right-of-Way Management*, 2002.

SEAN GEDDES

Senior Associate / Aquatic Biologist

Sean Geddes B.Sc. (Hons.)

Senior Aquatic Biologist
31 years of experience · Waterloo, Ontario

Sean Geddes has over 30 years of experience in the field of ecological sciences, including fish habitat and community assessments, impact analyses and site monitoring for projects in the aggregate, waste management, energy, transportation, and land planning and development sectors. His experience includes a mix of private and public sector work, with projects ranging from streams to large rivers, and small inland lakes to the Great Lakes environments. He has conducted numerous assessments of aquatic habitat to determine potential impacts, and has been responsible for the development of habitat enhancement plans aimed at achieving the best productivity results for both short and long term time frames.

Sean previously served as a plan review aquatic biologist with the Grand River Conservation Authority where he was responsible for the review of projects under the federal *Fisheries Act* on behalf of DFO. Sean has developed extensive experience in the permits and approvals process, including developing and negotiating fish habitat mitigation and offsetting approaches to achieve *Fisheries Act* authorizations. He maintains an excellent rapport with DFO and other review agencies.

Sean applies his combined public and private sector experience to a variety of project types involving aquatic habitat, however he also has an excellent understanding of terrestrial components and applies this integrated knowledge base to identify key issues and potential complexities associated with projects of all sizes. Sean examines projects in a practical manner, and develops logical, cost-effective solutions that address client interests, habitat issues and agency concerns.

EDUCATION

Specialized Honours Bachelor of Science, Fisheries Biology, minor in Wildlife Biology, University of Guelph, Guelph, Ontario, 1990

CERTIFICATIONS & TRAINING

Certificate, Fisheries and Oceans Canada / Fisheries Protection Act Training, Burlington, Ontario, Canada, 2015

Certificate, Toronto and Region Conservation Authority / Sediment and Erosion Control Workshop, Toronto, Ontario, Canada, 2003

Certificate, Reach Training (Parish Geomorphic) / Fluvial Geomorphology Introductory and Advanced Training Courses, Burlington, Ontario, Canada, 2002

Certificate, Fisheries and Oceans Canada, Watershed Science Centre and Trout Unlimited / Design Standards for Improving Fish Habitat Management, Dorset, Ontario, Canada, 2001

Certificate, State Association of Wetland Managers / Northeast Training Workshop, Dam Removal and Restoration of Biological Integrity, Plymouth, Massachusetts, USA, 2001

Certificate, State Association of Wetland Managers / Northeast Training Workshop, Stream Restoration: Natural Channel Design, Fairlee, Vermont, USA, 2000

Certificate, Fisheries and Oceans Canada, Conservation and Protection Branch / Regional Habitat Enforcement Training, Burlington, Ontario, Canada, 2000

Making it Work!, Third International Conference on Natural Channel Systems, Ottawa, Ontario, Canada, 2004

Stream Corridors Adaptive Management and Design, Second International Conference on Natural Channel Systems, Niagara Falls, Ontario, Canada, 1999

Certificate, St. John Ambulance / Standard First Aid with CPR C + AED, Guelph, Ontario, Canada, 2016

PROJECT EXPERIENCE

NATURAL SCIENCES & HERITAGE RESOURCES

Columbia Lake Dam Removal and Lake Enhancement, Waterloo Research and Technology Park | Waterloo, Ontario | Project Biologist

Design of habitat enhancements for reconfigured lake and bypass creek channel.

Fish Habitat Compensation Plan, Mitchell's Creek | Stouffville, Ontario | Project Manager

Development of habitat compensation featuring removal of on-line pond barriers.

Wateree River Fisheries Study | Richland County, South Carolina | Aquatic Biologist

Stantec carried out a study of diadromous fish in support of a FERC Relicensing Application.

Field Studies, MNR Lake Erie Research Station* | Research Assistant

Sean's experience includes numerous contracts that provided grounding in a wide variety of field studies including: index gill-netting, interagency bottom trawling, and fish species sampling; chlorophyll a, dissolved oxygen and POC monitoring; exotic species monitoring, and, zooplankton collection, preservation, taxonomy and biomass (secondary productivity) research.

Stream Habitat Assessments and Fish Community Inventories, GRCA* | Critical Habitat Technician, Fish Habitat Restoration Technician

Under separate contracts with GRCA, Sean cultivated his field skills by conducting numerous stream habitat assessments and fish community inventories to assist in identifying critical coldwater habitat areas of Washington Creek and Strasburg Creek. His experience also included landowner contact and the development of habitat rehabilitation recommendations. On Strasburg Creek, Sean implemented many rehabilitation options including the installation of habitat structures to improve spawning and rearing habitat for brook trout.

Water Quality Sampling, Ministry of Environment* | Aquatic Survey Technician

Sean conducted water quality sampling of inland lakes as part of the experimental research and design of destratification and aeration devices to improve lake water quality by eliminating anoxic bottom conditions.

ENVIRONMENTAL PLANNING

Fisheries Assessment | Town of Whitchurch-Stouffville, Ontario | Aquatic Ecologist

Completed fisheries habitat and community investigations on a tributary to east Stouffville Creek.

North Markham Future Urban Area* | Markham, Ontario | Project Manager, Environmental

Coordinated the multi-year terrestrial and aquatic field program for natural heritage features in the Future Urban Area of North Markham. Lead fisheries biologist for analysis of headwater stream network and Redside Dace habitat issues.

Brantford Industrial Park Site Development | Brantford, Ontario | Project Manager, Environmental

Coordination of agency consultation, design of habitat compensation for watercourse alterations in commercial block.

Springdale North Phase 1 Master Environmental Servicing Plan | Brampton, Ontario | Project Manager

Coordinated the field programs for terrestrial and aquatic ecosystem data collection to identify the natural heritage existing conditions for a 650 ha area in the City of Brampton. Phase 1 identified preliminary constraint mapping and Natural Heritage System to guide future land use planning in the block of lands.

Habitat Assessment, Upper Berczy Creek | Richmond Hill, Ontario | Aquatic Ecologist

Completed fish habitat assessments for upper tributaries in Berczy Creek watershed.

Environmental Impact Statement for Road Crossings of 14 Mile Creek | Town of Oakville, Ontario | Aquatic Ecologist

Preparation of EIS and fish habitat impact assessment for internal subdivision road crossing of 14 Mile Creek.

Channel Realignment, Rymal Road at Swayze Road | Stoney Creek, Ontario | Aquatic Ecologist

Completed conceptual design and negotiations for fish habitat compensation on a commercial development property.

Columbus Subwatershed Study | Columbus Landowner Group | Oshawa, Ontario | Senior Aquatic Biologist

Coordinated the field program for the collection of aquatic habitat and fisheries field data as part of the preparation of a Subwatershed Study report intended to support the development of a Secondary Plan for the Columbus Community area north of Oshawa.

Windsor Annexed Area | Windsor, Ontario | Project Manager

Identification and assessment of natural heritage features to develop a Natural Heritage System for lands being considered for annex by the city.

Bridle Path Crossing of Burdenet Creek | Markham, Ontario | Aquatic Ecologist

Carried out compensation negotiations for bridge crossing and creek realignment.

Fisheries Plan Review, Grand River Conservation Authority (GRCA)* | Plan Review Biologist

Sean completed critical review of planning issues, proposed plans of subdivision, permit applications and proposed works around water in the context of potential impacts to aquatic habitat for all areas of the Grand River Watershed. As the principal reviewer of projects affecting aquatic habitat, he was required to meet the conditions of the DFO/GRCA Level 3 Review Agreement, including determining the status of harmful alteration, disruption or destruction (HADD) of fish habitat, discussing methods of mitigation and negotiation of compensation packages. Sean also provided technical advice on a variety of general inquiries, construction methods and mitigation measures for a range of projects throughout the Grand River watershed. He also supplied technical assistance and fostered partnership projects with private interest groups and clubs.

ENVIRONMENTAL ASSESSMENTS

Colchester Harbour Environmental Assessment | Town of Essex | Colchester, Ontario | Senior Aquatic Biologist

Conducted fish habitat assessment of harbour and boat launch area as part of EA for DFO transfer to municipality.

Highway 24 Intersection Improvements at Footbridge Road | Cambridge, Ontario | Fisheries Biologist

Fish habitat compensation design and procurement of Fisheries Act Authorization.

Sewer Forcemain Crossing of Credit River | Glen Williams, Ontario | Project Manager, Fisheries and Natural Heritage

Coordination of agency consultation and information collection/collation for environmental approvals.

Georgia Pacific Sediment Remediation in Beaverdams Creek | Thorold, Ontario | Project Manager, Fisheries and Natural Heritage

Coordination of agency consultation and information collection/collation for environmental approvals.

Hamilton Harbour Piers 22 and 27 | Hamilton, Ontario | Project Manager

Agency liaison through CEAA process, coordination of project direction and process, habitat compensation and mitigation design for redevelopment of two pier areas.

Island Falls Hydroelectric Dam EA | Smooth Rock Falls, Ontario | Project Fisheries Biologist

Design of preliminary field studies and agency pre-consultation for a proposed hydroelectric dam; coordinated multiple field programs related to aquatic ecology and fish habitat data collection.

Chinguacousy Road EA and Preliminary Design | Brampton, Ontario | Project Manager, Environmental

Identification of fish habitat compensation alternatives and approach to road crossing design.

Highway 401 | Oxford County Road 3 to Cedar Creek Road, Ontario | Fisheries Biologist

Assessed site compliance and ensured water crossing initiatives were administered in accordance with contract and Fisheries Act. Provided input into appropriate set up of mitigation measures, reporting to on-site Senior Environmental Inspector.

Hardrock Gold Mine | Geraldton, Ontario | Senior Aquatic Biologist

Coordinated the comprehensive field program for a variety of disciplines including aquatic and terrestrial ecology, hydrology, water quality, groundwater, contaminants, and air quality. Review of potential offsetting approaches for fish habitat and assistance with design of long term fisheries monitoring program.

Park Place | Barrie, Ontario | Environmental Project Manager

Coordinated field programs for the assessment of aquatic and terrestrial natural heritage features and provided environmental planning input to redevelopment of Molson Park site.

Alcona Downs | Innisfil, Ontario | Project Manager

Assessment of aquatic and terrestrial features in planning of subdivision. Preparation of Letter of Intent package for submission to DFO to support realignment and enhancement of existing site drainage features.

Ayr Wastewater Treatment Plant Upgrade and Nith River Crossing | Ayr, Ontario | Project Biologist

Fisheries Act Letter of Intent for contingency open cut crossing of sewer forcemain across the Nith River.

York Downs Golf and Country Club Channel Rehabilitation | Markham, Ontario | Project Assistant

Guided removal of historic check dams and design of alternate water-taking approach.

CN Milton Logistics Hub | Milton, Ontario | Senior Aquatic Biologist

Developed and completed analysis of potential offsetting approaches to address fish habitat alterations as part of site plan development during EA process. Testified before CEAA Hearing Panel.

Flying J Environmental Impact Statement (EIS) | City of Hamilton, Ontario | Project Manager

Preparation of an EIS documenting aquatic and terrestrial features to support site plan application.

Emery Estates, Bradford-West Gwillimbury | Bradford, Ontario | Project Manager

Rural estate subdivision planning to provide adequate protection and management of drainage features and obtain agency approvals on plan of subdivision.

Steeles Avenue Crossing of Fletcher's Creek | Brampton, Ontario | Project Manager

Development of creek enhancement plan and procurement of agency approvals.

Silver Lake Environmental Assessment and Environmental Impact Study | City of Waterloo | Waterloo, Ontario | Ecosystems Coordinator

Coordinated ecosystems (aquatic and terrestrial) field work and data review to support analysis of alternatives and recommend a preferred alternative with development of habitat restoration treatments in various areas of Waterloo Park.

East Boundary Road Environmental Assessment* | Cambridge, Ontario. | Project Manager, Natural Environment

Coordinated multi-disciplinary natural heritage studies (terrestrial and aquatic) to identify key environmental features for consideration during analysis of route alternatives.

Columbia Lake Dam Removal and Lake Enhancement,
Waterloo Research and Technology Park | Waterloo,
Ontario | Project Biologist

Design of habitat enhancements for the reconfiguration of
Columbia Lake and a lake bypass channel for Laurel
Creek.

RESEARCH / LABORATORIES

Fish Genetics Research, University of Guelph* | Fish
Genetics Research Technician

As a laboratory technician in a high quality control lab,
Sean was responsible for the extraction and
electrophoretic separation of mitochondrial DNA from
fish. The analysis of the DNA material was used to
determine stock origin of walleye and salmonids in the
Great Lakes and Mississippi River basins.

Redside Dace Management Approaches in the GTA |
Project Co-manager

Contributing author to policy review and management
approach document for the endangered Redside Dace,
prepared for MNR and Building Industry and Land
Development Association (BILD) (in press).

HEATHER AMIRALT
Surface Water Engineer

Heather Amirault P.Eng., CAN-CISEC

Water Resources Engineer - Stream Restoration
15 years of experience · Waterloo, Ontario

Heather is a Water Resources Engineer whose main project focuses are in the areas of stream restoration and geomorphic assessment. She has completed several courses in applied fluvial geomorphology and natural channel design. Stream project work includes natural channel designs, meander belt assessments, reference reach surveys, geomorphic assessments, erosion assessments, sediment transport analyses, fish habitat compensation projects, and channel relocations. Heather works with clients and regulators to develop design solutions that are functional, constructible, cost effective to build, and provide ecological and habitat benefits. She is proficient at data collection, geomorphic assessment, and reporting results in clear and understandable language. She is very experienced in preparing a variety of permit applications as part of a multi-disciplinary team of scientists, planners, and engineers.

Heather is the design engineer for many of Stantec's Canadian stream restoration designs. As the designer and preparer of the tender documents and special provisions, she develops a deep familiarity with the project and project requirements; this enables her to provide clear direction through construction observation services. Heather has been an important member of many design teams for a broad range of projects ranging from the planning phase through to construction.

EDUCATION

Applied Fluvial Geomorphology (Rosgen I), Fayetteville, Arkansas, 2009

River Morphology and Applications (Rosgen III), Asheville, North Carolina, 2010

River Restoration and Natural Channel Design (Rosgen IV), Sun Valley, Idaho, 2011

Canadian Rivers Institute Stream Restoration Design Workshop, Alma, New Brunswick, 2014

River Assessment and Monitoring (Rosgen II), Shepherdstown, West Virginia, 2010

B. Sc. (Eng.), Environmental Engineering, University of Guelph, Guelph, Ontario, 2006

CERTIFICATIONS & TRAINING

Canadian Certified Inspector of Sediment and Erosion Control, CISEC, Inc., Toronto, Ontario, 2016

REGISTRATIONS

Professional Engineer #100116290, Professional Engineers Ontario

PROJECT EXPERIENCE

HYDROLOGIC / HYDRAULIC ASSESSMENTS

City of Prince Albert Floodplain Mapping Study | Prince Albert, SK, Canada | 2019 | Water Resources Engineer and Technical Lead

The City of Prince Albert Flood Plain Mapping project was completed to identify and assess flood hazards within the City of Prince Albert along approximately 16 km of the North Saskatchewan River and approximately 6.5 km of the Little Red River, also known as the Spruce River. Updating hydrology for both Rivers was completed as part of this study. The 1:500 year flood plain delineation, including floodway and flood fringe, was modeled using HEC-RAS 2D. Heather was the technical lead for the work, tasks include project coordination, 2D hydraulic modelling, reporting, and developing conceptual alternatives to protect high risk areas of the City from flooding.

STREAM/RIVER RESTORATION

Sullivan's Pond to Lake Banook Fish Passage Project | Dartmouth, Nova Scotia | Water Resources Engineer

Project included preliminary design, detailed design, and tender for a fish passage project from Sullivan's Pond to Lake Banook in Dartmouth, Nova Scotia. Design included a series of retrofits to existing culverts beneath Hawthorne Street, as well as nature-like fishways (NLF's) to provide passage up and around Shubenacadie Lock. Provided senior design and review of field work, design, analysis, reporting, and tender preparation efforts.

CN Milton Logistics Hub - Environmental Assessment | Canadian National Railway | Milton, Ontario, Canada | 2016-present | Stream Restoration Engineer

Lead Stream Restoration engineer as part of a Federal Environmental Impact Statement (EIS) for a new proposed intermodal terminal and associated grade separations. Included geomorphic assessment and preliminary design of channel realignments with habitat enhancement and fish passage considerations, as well as preparation of Technical Data Report on channel realignment appendix of the EIS. The realignment design was based on a tractive force design and included riparian wetlands, oxbow lakes, and a variety of instream grade control and habitat structures. A design was also provided to realign a small tributary and take an existing farm pond offline to improve water quality and fish habitat. Participated in Canadian Environmental Assessment Act (CEAA, 2012) panel hearing, permitting, and final design. Includes engagement with Federal regulators, Conservation Halton and other regulatory, indigenous and public stakeholders.

Victoria Park Lake Improvements Detailed Design and Construction | City of Kitchener | Kitchener, Ontario, Canada | Water Resource Engineer

This project implemented the Class EA recommendations by finalizing design drawings of the lake and its various components including sediment removal, reconstruction of shorelines, rehabilitation of a Heritage Bridge, fish removal, tree protection plans, aquatic habitat structures and the addition of new park elements such as trails, a pedestrian bridge, landscaping and restoration works. Tasks included redesign of the lake perimeter and bathymetry including the design of a forebay for sediment capture. Permitting support and site inspection. Construction was completed in 2012.

Idlewood Creek Dam Removal and Stream Restoration | City of Kitchener | Kitchener, Ontario, Canada | Senior Stream Restoration Engineer

Completed project coordination, geomorphic assessment, detailed design, permitting, and tendering, and construction administration for the removal of two dam structures and an old road crossing on Idlewood Creek. The new channel sections were designed for fish passage to provide connectivity between the Grand River and the upper reaches of Idlewood Creek. Baffles were designed and installed in a large culvert to provide fish passage through the culvert. 2D modelling was used to confirm fish passage and floodplain design. The restored sections and newly fish accessible sections of Idlewood Creek are included in the City of Kitchener's Fish Habitat Bank. Construction occurred in 2018.

LNG Canada – Juvenile Coho Habitat Offsetting | Kitimat, British Columbia | Water Resources Engineer

Prepared the design for over 80,000 m² of juvenile Coho habitat as part of a project to offset impacts from a proposed LNG plant. Work included field assessments, geomorphic investigations, design, and permitting assistance. Design incorporated input from fisheries biologists, hydrologists, hydrogeologists, and vegetation specialists. The project included the design of groundwater channels, fish habitat structures, instream grade controls and pond areas.

Carruthers Creek Bank Stabilization | Confidential Client | Ajax, Ontario, Canada | Water Resources Engineer

Prepared a design to stabilize a steep eroding bank that was putting property at risk. Tasks included geomorphic survey and assessment of existing conditions, updating existing and proposed conditions hydraulic modeling, natural channel design, reporting and permit applications. The design solution included the use of instream structures to provide grade control and stabilize the banks. Structures included constructed riffles and woody debris toe bank protection. Other design elements included grading a point bar and creating a bankfull bench. A native species planting plan was also implemented. Construction was completed in 2015.

Laurel Creek At University of Waterloo | Waterloo, Ontario | Water Resources Engineer

The installation of a new sanitary sewer crossing at a shallow depth under Laurel creek required that Stantec provide stream restoration services to restore the creek bed and banks as well as provide grade control over the sewer to prevent exposure. Work included a geomorphic assessment of the existing conditions and the design of a constructed riffle feature to provide grade control over the sewer. Construction was completed in 2014.

Ellingham Brook Stream Rehabilitation | Gagetown, New Brunswick | Water Resources Engineer

Reviewed preliminary existing conditions data and led a team to collect existing conditions geomorphic data for 600 m of a degraded reach of Ellingham Brook. Analyzed field data and developed a restoration plan to minimize bank erosion rates in the reach and improve fish habitat diversity using a Priority 3 restoration approach. Challenges included the proximity of a road embankment, bedrock features, and a confined valley. Assisted with DFO permitting process. Project was constructed in phases with the first phase complete in 2017.

Brierwood Creek Realignment | Rural Municipality of Wallace-Woodworth | Rivers, Manitoba | Water Resources Engineer

Provided QA/QC for a realignment of 150 m of Brierwood Creek away from a road embankment failure. Assisted with the preparation of tender documents and provided support for contract administration. Construction 2016.

16 Mile Creek Natural Channel Design for Redside Dace Habitat | Halton Region | Milton, Ontario, Canada | Water Resources Engineer

Restoration of 500 m of a cable concrete lined tributary of 16 Mile Creek using natural channel design techniques. Instream features and habitat structures were designed for Redside Dace. Construction was completed in 2015.

West London Dykes Geomorphic Assessment | London, Ontario | Design Engineer

Project involved a geomorphic assessment to determine the cause of scour at the toe of the dyke in two specific locations. Work included bathymetric surveys, bed material analysis, review of historical aerial imagery and a review of flow data. Project culminated in the development of concept plans to deal with scour. The concept plans included modifications to an abandoned sewer crossing, toe protection and the installation of rock vanes to deflect flow away from the dykes.

White Rock Fish Passage Restoration | White Rock, Nova Scotia | Water Resources Engineer

Conducted field analysis and survey to determine limiting factors for fish passage in a reach of the Gaspereau River downstream of a fish ladder. Identified areas of greatest concern for fish passage and prepared conceptual natural channel designs and cost estimates for restoration of fish passage. Proposed concept uses material available on site to extent possible.

Schneider Creek Naturalization | City of Kitchener | Kitchener, Ontario | Water Resources Engineer

This project involves the naturalization of over 2 km of Schneider Creek in the City of Kitchener. Under existing conditions, the channel is a trapezoidal concrete conveyance system. As lead designer, Heather prepared a natural channel design for the watercourse to improve habitat, water quality, and park aesthetics. The design includes the use of instream structures such as woody debris toe, constructed riffles, cross-vanes, and log j-hooks for bank protection and grade control. The project made use of wood from the City's ash tree removal program and used 3-D design techniques to minimize cut-fill throughout the project reaches. This project was funded through the City's Stormwater Utility. Construction of the first 1.8 km was completed in 2015.

Moose Jaw River Bank Stabilization | Confidential Client | Moose Jaw, Saskatchewan, Canada | Water Resources Engineer

This project was completed to address serious erosion and bank stability issues at two bends in the Moose Jaw River. The erosion was putting bridge and trail infrastructure at risk. The design included the use of woody debris toe bank protection, rock spurs, and grading out a bankfull bench and point bars. Construction was completed in 2016.

Tributary of Little Rouge River at Ninth Line | Markham, Ontario | Water Resources Engineer

Conducted field assessment and geomorphic survey of over 2 km of a Redside dace stream. Prepared conceptual designs and options for the restoration of the watercourse which has been heavily impacted by historical realignment and agriculture practices. Working in collaboration with Toronto and Region Conservation Authority and Parks Canada to develop a cost effective natural channel solution that works in harmony with adjacent rail and agricultural land uses.

Plum Creek Bank Stabilization | Souris, Manitoba | Water Resources Engineer

Conducted geomorphic analysis of erosion site following significant flood event that damaged banks and nearby park infrastructure. Prepared natural channel design to realign eroded bank, re-establish point bar formation and maintain connectivity with oxbow lake. Prepared HEC-RAS hydraulic model of proposed conditions. Worked in cooperation with bridge designers to determine appropriate elevation of downstream weir. Assisted with DFO permitting process.

Little Red River Bank Stabilization | Prince Albert, Saskatchewan, Canada | Water Resources Engineer

Following a spill event, temporary water supply infrastructure resulted in severe bank erosion on several outer bends of the Little Red River through a public park. Heather developed a bank restoration plan for the eroding banks using woody debris and other natural materials. The new banks are stable, protect park infrastructure, and blend into the natural environment while providing enhanced fish habitat. Heather worked with a local contractor that had never completed this type of bank work before, providing support and contract administration services during construction. Project construction was complete in 2018.

Mathers Stream Channel Restoration | London, Ontario | Water Resources Engineer

Conducted geomorphic assessment of existing conditions and a local reference reach to develop design parameters for 800 m of new channel. Prepared a natural channel design including riparian habitat and ponds. Mather's Stream though the site was contained in a tile drain, following construction in 2016 the flows are now above ground in a channel that provides fish habitat. The site is being included in a fish habitat bank for the City of London.

P9 Channel Design | London, Ontario | Water Resources Engineer

Provided senior design input for the design of 450 m of channel to convey outflow from a proposed stormwater facility to a tributary of Dingmans Creek. Natural channel design was used to develop a meandering watercourse with a stable planform and profile. Challenges for this project included lowering the entire watercourse to accommodate the new SWM outlet, flood protection for neighbouring properties and a narrow valley width.

**Mill Creek Geomorphic Assessment | Edmonton, Alberta
| Water Resources Engineer**

Project includes the geomorphic assessment of over 4 km of Creek to determine erosion rates, erosion thresholds, and prioritize risk areas. The City of Edmonton will use the results of the assessment to develop a solution that reduces erosion in the creek valley.

Oshawa Creek Relocation | City of Oshawa | Oshawa, Ontario, Canada | Water Resources Engineer

Provided supplemental stream construction observation services to the Contract Administrator - the City of Oshawa for the realignment of 250 m of Oshawa Creek to accommodate improvements to Conlin Road. Provided input and advice on the construction of a variety of instream structures, water management, soil stabilization. Construction was complete in 2014 and fish were observed in the newly constructed reach of the creek within weeks of completion.

Upper Qu'Appelle Channel Conveyance Feasibility Study | Saskatchewan | Water Resources Engineer

River surveys were conducted along ninety-three kilometres of the Qu'Appelle River to evaluate channel morphology, river patterns and processes, and assess bank erosion rates. The data were collected to facilitate the preliminary design of river restoration measures needed to stabilize the river. A detailed reach by reach assessment report was prepared to document river conditions, flow capacity, and morphology. Concept designs for river restoration and increased flow capacity were prepared.

Bronte Creek Emergency Bank Stabilization | Oakville, Ontario | Water Resources Engineer

Existing conditions geomorphic survey was completed along a reach of Bronte Creek that is experiencing erosion at the location of a temporary Bridge crossing. A solution was developed to direct flows away from the bank and protect the bank at the bridge abutment. The design incorporated elements of natural channel design and includes habitat elements for the local fish species. Permits were obtained from the Conservation Authority and MNR. A temporary stabilization of rock toe protection was designed, permitted and installed in 2014.

Laurel Creek Rehabilitation - Regina Street South to Weber Street North | City of Waterloo | Waterloo, Ontario | 2019-2020 | Engineer Design Lead

Laurel Creek is a heavily urbanized creek in Uptown Waterloo that is beginning to fail in certain sections, threatening building foundations, and linear municipal infrastructure. This project involved the evaluation of existing geomorphic conditions, the preparation of a stream rehabilitation design (including geotechnical design of armourstone retaining walls), securing permits (Conservation Authority, and DFO), and construction administration services for the rehabilitation of 800 m of Laurel Creek. Heather provided engineering design oversight and construction administration services.

Bank Stabilization Design on East Munday Creek | Township of Langley | Langley City, British Columbia, Canada | 2020 | Senior Engineer

Heather was the Senior Design Engineer for the detailed design of bank stabilization works on two eroding bends on East Munday Creek. The bank stabilization design used natural channel design and bio-engineering to mitigate active erosion and channel migration adjacent to private property adjacent to the creek. The design also included the stabilization of a stormwater outfall.

Penticton Creek Natural Channel Design for Fish Passage | Penticton, British Columbia | Water Resources Engineer

This project was initiated to provide improved fish passage through a steep concrete lined creek channel. Work included general survey of existing conditions, and survey of reference conditions. A design will be developed to provide conveyance, fish passage, and channel stability.

Forwell Creek Bank Repairs | Waterloo, Ontario | Water Resources Engineer

Provided construction supervision and professional opinions for the restoration of three areas of eroded banks. This work was completed as part of a highway improvement project and involved co-ordination with contractors, contract administrators, and fisheries biologists.

Torrance Creek Natural Channel Design | Guelph, Ontario | Water Resources Engineer

Prepared a natural channel design for the Headwaters of Torrance Creek as part of a subdivision development plan. The work included reference reach surveys, design and permitting. The new channel will provide cold water habitat for fish as well as turtle nesting habitat. The HEC-RAS model for the watercourse was also updated to model the impacts of the proposed new channel.

Powers Creek Flood Recovery Project | City of West Kelowna | Kelowna | 2019 | Project Engineer

High flows during the 2017 freshet event caused flooding and mobilized channel bed material in Lower Powers Creek that resulted in areas of aggradation, degradation and bank erosion. The impacts from the freshet event put critical City of West Kelowna (CWK) infrastructure at risk of flooding and erosion, including Gellatly Road, Gellatly Road Bridge, two pedestrian bridges, and the East Trunk Lift Station. The CWK retained Stantec to assist in the engineering and environmental planning of the recovery work to restore conveyance capacity within Powers Creek, particularly at the Gellatly Bridge, and increase stability to areas of bed degradation and bank erosion. The work proceeded in two phases due to spawning kokanee at the site. A channel was designed and constructed to provide spawning habitat for kokanee and adfluvial rainbow trout. Project included funding from the disaster financial assistance program. Heather was the project river design engineer and completed the geomorphic assessment, hydraulic assessment, natural channel design, design of spawning habitat, and supported tendering and construction.

Brook Creek Realignment and Habitat Compensation | Coburg, Ontario | Water Resources Engineer

Completed a design to realign the coldwater Brook Creek to provide a better approach angle and reduce risk at a railway crossing where an additional track had extended the culvert into a meander bend and the embankment was at risk due to erosive forces. The design included hydraulic analysis, substrate sizing, the use of toe-wood and sod mat bank protection, and a rock vane to improve flow direction into the culvert. Challenges included modeling the impact of a backwater effect resulting from a constriction downstream and sizing substrate properly for stability and for rainbow trout spawning habitat. Construction complete in 2014.

Laurel Creek Bank and Bed Stabilization | City of Waterloo | Waterloo, Ontario, Canada | Water Resources Engineer

The EA recommendations for this project included the rehabilitation of a degraded reach of Laurel Creek where a pedestrian bridge was causing erosion problems and a trunk sanitary sewer was exposed in the creek bed. Detailed fieldwork included conducting a full geomorphic survey over 200 m and assessments of entrenchment and bank stability. The design work included innovative natural bank stabilization design and a grade control design for the area of the creek above the sanitary sewer line as well as obtaining permits for construction in the watercourse. Provided on-site construction observation for the stabilization of 200 m of channel banks using coir soil lifts and supervised the installation of a constructed rock riffle to provide grade control and erosion protection at the sanitary sewer creek crossing.

Chinguacousy Road Widening, Fish Habitat Compensation | City of Brampton | Brampton, Ontario, Canada | Water Resources Engineer

This project involved the widening of Chinguacousy Road from four to six lanes. The road passes over a highly disturbed tributary to the Credit River at a location where red-side dace, an endangered species, have been found. Agency approvals required that aquatic habitat conditions for red-side dace be maintained or improved through the use of natural channel design principles in conjunction with the road widening construction. Project tasks included assisting with the stream restoration design through the development of a mini-regional curve to be used as a tool to predict bankfull and inner-berm dimensions and assisting with the detailed survey of the fluvial geomorphological characteristics of a reference reach. Heather also provided full time construction observation services for the natural channel construction.

STUDIES AND EVALUATIONS

14 Mile Creek Bank Erosion Assessment | Town of Oakville | Oakville, ON | 2020 | Project Manager, Engineer

Completed a site inspection of an area of failing creek bank slopes along 14 Mile Creek near Speers Road. Prepared report detailing site conditions and proposed concept slope stabilization solutions to protect near by property and infrastructure.

Bass Pro Mills Road Extension Environmental Assessment | City of Vaughan | Vaughan, ON | 2020 | Water Resources Engineer

Completion of a geomorphic assessment and meander belt assessment to identify constraints and restoration / realignment opportunities within the study area. This information will help to inform discussions around the selection of a 'preferred' roadway alignment. Concept design parameters and a 30% design realignment planform will be determined for the preferred alternative.

Oakville Major Slopes Study | Oakville, Ontario | 2008-2019 | Project Manager and Water Resources Engineer

Completed a study to evaluate and prioritize erosion sites and stormwater outlets along over 12 km of Bronte Creek and 16 Mile Creek within the Town of Oakville. Study involved field assessments of the banks and valley slopes stability, GIS mapping of erosion hazards and developing a risk ranking methodology that incorporated both slope and erosion hazards. Reporting included mitigation recommendations and costs for the highest priority sites.

Victoria Park Lake Improvements Class Environmental Assessment | City of Kitchener | Kitchener, Ontario, Canada | Water Resources EIT

This project considered opportunities to improve the water quality conditions of the Victoria Park Lake, created in 1895 in downtown Kitchener. Heather assessed water quality conditions both within the lake and the upstream areas and recommended measures to improve conditions and limit future sediment deposition in the lake, which is primarily responsible for degraded lake conditions. Hydraulic modelling updates (HEC-RAS) were also completed for this project. The project included preliminary concepts for lake reconfiguration and significant public consultation in the form of Public Information Centers and a Public Advisory Committee.

Humber River Weir Removal Feasibility Study | Toronto & Region Conservation Authority | Toronto, Ontario, Canada | Water Resources Engineer

Stantec has been retained by the Toronto and Region Conservation Authority (TRCA) to assess the present and future function of ten (10) inline concrete weirs along the lower Humber River that are currently barriers to fish passage. Project tasks include conducting an existing conditions bathymetric survey for each weir, preparing a decision matrix for determining the preferred option at each weir, updating a hydraulic model to reflect proposed conditions, and developing a concept design for the removal of one weir.

Geomorphic Assessment of Multiple Watercourse Crossings for Enbridge Pipeline Project | Greater Toronto Area, Ontario | Water Resources Engineer

Heather led a team in providing field services and reporting for the assessment of over 20 watercourse crossings in the Greater Toronto Area. Assessments included an evaluation of existing conditions, longitudinal and cross-section surveys using Total Station, pebble counts, Rapid Geomorphic assessments, and scour assessments.

Meander Belt Assessment for Mayfield Road
Watercourse Crossings | Region of Peel, Ontario | Water
Resources Engineer

Completed field assessments and desktop analysis to
develop meander belts and 100-year erosion rates for 11
watercourse crossings of Mayfield Road.

Waterloo and Hespeler Wastewater Treatment Plants
Assimilative Capacity Study - Hydraulics and 7Q20 Flow
Determination | Region of Waterloo, Ontario | Water
Resources Engineer

As part of the multi-component study, Heather conducted
a morphological assessment of the Grand River reach of
interest, coordinated survey crews in obtaining detailed
cross-section data, developed and implemented in-situ
dye tracer studies for multiple locations, and updated /
calibrated existing hydraulic models. Also included was
the determination of seasonal 7Q20 flows for nine flow
gauges in the Grand River system through a statistical
analysis of historical flow data. The calibrated hydraulic
model was used to determine river velocities under
various low flow regimes for input into the water quality
model.

Meander Belt Assessment - Weber Street North
Improvements | Woolwich Township, Ontario | Water
Resources Engineer

Assisted with the field evaluation and interpreted air
photo data to determine erosion rates on Martin Creek
near the Weber Street crossing. Work was completed in
support of a meander belt assessment required as part of
planned improvements to the intersection of King Street
North and Weber Street North.

PUBLICATIONS

Chandler, T. and H. Amirault. Regional curves to support
stream restoration initiatives in Southern Ontario. DOI:
10.1080/07011784.2018.1503067. *Canadian Water
Resources Journal.*, 2018, pp. '1-14'.

PRESENTATIONS

Sediment Control and Urban Stream Restoration: A
Canadian Case Study. *Challenge Meets Opportunity:
Global Erosion Control Case Studies -- IECA Global
Webinar*, 2020.

Amirault, H. and S. Stuart. Stream Restoration Project –
Success through Monitoring. *American Fisheries Society
Ontario Chapter Annual General Meeting*, 2019.

Amirault, H. and T. Chandler. The Answer is in the River:
Regional Curves to Support Stream Restoration
Initiatives in Southern Ontario. *Canada Water Resources
Association National Conference*, 2019.

Stream Restoration - Application of Natural Channel
Design Principles for Infrastructure Protection. *CWRA-SK
Webinar Series*, 2020.

Filsinger Park Stream Naturalization A Canadian
Restoration Experience. *Mid-Atlantic Stream Restoration
Conference, Baltimore, Maryland.*, 2017.

Garrett, A. and H. Amirault. Emergency Response Leads
to Bank Stabilization Needs in Prince Albert, SK-
Introducing Natural Channel Techniques to a New
Region. *Natural Channels Conference*, 2018.

Amirault, H. and S. Cowan. Natural Channel Design
Methods - Better Together. *TRIECA*, 2019.

Amirault, H. and D. Luzi. To Pipe or Not to Pipe - Erosion
Issues and Solutions in an Urban Watercourse in
Edmonton. *TRIECA*, 2018.

Amirault, H. and L. McDougall. Restoration of a Confined
Urban Sytem - Funding and Design. *Natural Channels
Conference*, 2018.

ANDREW TAYLOR
Senior Ecologist

Andrew Taylor B.Sc.

Senior Ecologist

Andrew is a knowledgeable senior terrestrial ecologist and project manager who has served as an expert witness at Boards and Tribunals, including the Environmental Review Tribunal and Canadian Environmental Assessment Act Review Panel. He has successfully managed a wide range of projects, including natural heritage assessments (NHA), environmental impact statements, constraint analyses, environmental implementation reports and natural heritage components of Environmental Assessments. He is familiar with various Acts and their application to projects, including the Migratory Birds Convention Act and Fish and Wildlife Conservation Act. He has extensive experience with the policies, field studies and permitting requirements pertaining to species at risk through both Ontario's Endangered Species Act and the federal Species at Risk Act.

Andrew has strong technical skills and is knowledgeable in the ecology of vascular plants, birds, mammals (including Caribou and bats), butterflies, dragonflies, breeding amphibians (calling frogs and toads), breeding salamanders (adult and egg studies) and reptiles. He has extensive experience with policies, field studies and permitting requirements pertaining to species at risk.

Andrew has provided terrestrial ecology expertise in a wide range of sectors, including aggregate extraction, urban lands, energy (including renewable energy), recreational development and infrastructure. Andrew's breadth of experience positions him to understand the potential for impacts to natural heritage features and wildlife from development activities and to develop mitigation and rehabilitation initiatives to minimize the net impacts to the environment and project design.

EDUCATION

B.Sc. (Hons), University of Guelph / Environmental Toxicology, Guelph, Ontario, 2001

CERTIFICATIONS & TRAINING

Certificate #032, Ontario Ministry of Natural Resources / Butternut Health Assessor, Hamilton, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Turkey Point, Ontario, 2006

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Environmental DNA (eDNA) Research Project, Guelph, Ontario

Collaborated with the University of Guelph to validate an innovative field technique which identifies the presence of wildlife by detecting traces amounts of DNA shed by organisms into their environment. The field trial focused on a species at risk (Jefferson Salamander) using a new technology that allows for sample collection, DNA extraction and analysis in the field.

Rice Lake Plains Joint Initiative*, Northumberland County, Ontario (Terrestrial Ecologist)

Tallgrass prairie research program. Identification and detailed cataloging of remnant tallgrass prairie sites, landowner liaison and education, development of tallgrass prairie management plans, reporting of findings.

* denotes projects completed with other firms

Andrew Taylor B.Sc.

Senior Ecologist

Alderville First Nations Black Oak Savannah*, Alderville, Ontario (Terrestrial Ecologist)
Tallgrass prairie and black oak savannah research program. Technical reporting. Vegetation monitoring, tallgrass prairie reconstruction, wildlife monitoring, Species at Risk reintroduction.

Selected Mining/Aggregate Experience

Premier Gold Hardrock Mine Environmental Assessment Report, Geraldton Ontario (Senior Ecologist)

Senior support for terrestrial (vegetation and wildlife) components of the Individual Class Environmental Assessment. Assessment and approvals for Species at Risk, including Caribou.

Wesdome Gold Mines Inc., Environmental Planning and Approvals, Proposed Tailings Management Facility, Wawa, Ontario (Senior Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk, including Caribou.

Lake Shore Gold Corp., Terrestrial and Wetland Assessment Study, Timmins, Ontario (Senior Ecologist)

Technical review of study design, results and conclusions of natural heritage assessment, including identification of wetlands, significant wildlife habitat and potential presents of species at risk.

Northern Graphite Corp., Environmental Approvals and Design, Bissett Creek Mine, Mattawa, Ontario (Senior Ecologist)

Completed field surveys and provided input into constraints analysis to address new mine, including approvals under the provincial Endangered Species Act.

Newman Todd Project, Red Lake Ontario (Senior Ecologist)

Acted as senior ecologist and advisory role on impact assessment of wildlife habitat and specifically species at risk.

Coloured Aggregates Inc., Open Pit Mine Expansion Study and Closure Plan Amendment, Ferromin Tomclid, South Canonto Township, Ontario (Senior Ecologist)

Co-authored Natural Environment Technical Report to address mine expansion, including considerations of wetlands, wildlife habitat and species at risk. Consulted with MNRF in the development of wildlife mitigation to avoid permitting requirements under the Endangered Species Act.

Proposed Bromberg Pit, Ayr, Ontario (Terrestrial Ecologist)

Completed natural environment field inventories with emphasis on Species at Risk (SAR). Provided support regarding provincial policies through the Municipal Board hearing.

Dufferin Aggregates Acton Quarry Extension, Acton, Ontario (Terrestrial Ecologist)

The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. Andrew has conducted extensive ecological field surveys and habitat assessments for breeding birds, amphibians and mammals with specific emphasis on Species at Risk (SAR).

* denotes projects completed with other firms

Andrew Taylor B.Sc.

Senior Ecologist

St. Marys Cement Flamborough Quarry License Environmental Impact Study and Level 2 Natural Environment Technical Report (Project Manager / Terrestrial Ecologist)

Identification and impact assessment of natural heritage features, compensation and management plan for Species at Risk (Butternut), water balance to maintain provincially significant wetland, salamander habitat and migration study, assessment of provincially significant woodland and significant wildlife habitat, environmental impacts of transportation.

Erin Pit Expansion, Erin Ontario (Project Manager, Wildlife Lead)

Completed study design and conducted field studies of wildlife, including species at risk. Co-authored Level II Natural Environment Technical Report with assessment of impacts and mitigation to wildlife habitats.

Transportation Planning

CN Milton Logistics Hub, Milton, Ontario (Terrestrial Ecologist)

Natural Heritage lead on the Canadian Environmental Assessment Act approvals, with a focus in affects to migratory birds and species at risk.

City of Toronto Fort York Pedestrian Footbridge, Toronto, Ontario (Terrestrial Ecologist)

Coordinated Natural Sciences component of project including assessment of potential impacts, with an emphasis on species at risk.

Natural Science Reports Related to MTO Highway Improvement Works, Various Sites, Ontario (Terrestrial Ecologist)

Produced numerous Natural Sciences reports related to highway improvement works. Where required, Fisheries Act authorization was obtained and Fish Habitat Compensation Plans were developed. Potential impacts to terrestrial vegetation, wetlands and wildlife were described for more than 20 projects.

Electrical Power Distribution

Bruce to Milton Transmission Reinforcement Project, Multiple Sites, Ontario (Terrestrial Ecologist)

Terrestrial surveys related for species at risk protected under the provincial Endangered Species Act (2007).

Coote's Paradise Transmission Reinforcement Project, Hamilton, Ontario (Terrestrial Ecologist)

Terrestrial surveys included vegetation community assessments, floral inventory, with emphasis on species at risk.

Clarington Transformer Station, Durham, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on wildlife habitat and species at risk impact assessment.

Midtown Electricity Infrastructure Renewal Project, Toronto, Ontario (Terrestrial Ecologist)

Senior ecologist coordinating species at risk inventories and permitting requirements.

Huycke Island Electrical Distribution Submarine Cable Replacement, Trent Hills, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

* denotes projects completed with other firms

Andrew Taylor B.Sc.

Senior Ecologist

Bruce Creek x Sarnia Scott TS B3N Line Protection Project, Sarnia, Ontario (Terrestrial Ecologist)

Senior ecologist and technical advisory on species at risk and implementation of Species at Risk Act permit.

Stratford Distribution Station, Stratford, Ontario (Terrestrial Ecologist)

Coordination of tree management plan and species at risk assessment.

Oil & Gas

Energy East Pipeline, Various Sites, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk for project spanning across Ontario through four ecoregions. Consultation with Ontario Ministry of Natural Resources regarding species at risk including, but not limited to, Caribou.

Hamilton to Milton Natural Gas Pipeline, Various Sites, Ontario (Terrestrial Ecologist)

Terrestrial surveys included vegetation community assessments and floral inventory, with emphasis on species at risk.

Bickford to Dawn Pipeline Project, Chatham, Ontario (Terrestrial Ecologist)

Terrestrial surveys included vegetation community assessments, floral inventory and species at risk habitat assessments. Study design and development in conjunction with local Ontario Ministry of Natural Resources district for Eastern Foxsnake, including a SAR 17b permit application.

Dow Moore, Corunna and Seckerton Pipeline Project, Lambton County, Ontario (Terrestrial Ecologist)

Species at risk habitat assessment and inventory. Study design and development in conjunction with local Ontario Ministry of Natural Resources district for several species protected under the Endangered Species Act.

Brantford Take-off to Kirkwall Valve Site Pipeline Project, Hamilton, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Genesis Pipeline Extension Project, Sarnia, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Parkway West Compressor Station, Halton, Ontario (Terrestrial Ecologist)

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Renewable Energy

Environmental Approvals, Multiple Projects, Various Sites, Ontario (Terrestrial Ecologist)

Approvals for wind and solar power project were obtained in Ontario through various approval processes including:

- Environmental Screening Reports/Environmental Review Reports in compliance with the Ministry of the Environment's Guide to Environmental Assessment Requirements for Electricity Projects
- Canadian Environmental Assessment Act (CEAA).

Andrew Taylor B.Sc.

Senior Ecologist

- Green Energy Act and O. Reg. 359/09 under the Environmental Protection Act with guidance obtained from the Draft Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2010).

Technical guidance was also provided to wind power project approvals in New Brunswick, Manitoba, Saskatchewan and Alberta. Andrew's involvement included pre-construction study design, coordinating and conducting monitoring for avian and other wildlife species, including targeted surveys for species at risk. Avian studies included breeding grassland and forest birds, wintering raptors and migratory surveys for waterfowl, raptors, passerines and shorebirds. Andrew conducted and coordinated acoustic bat surveys including data collection, species identification, data analysis and reporting, and co-authoring technical reports. He has also been instrumental in obtaining Endangered Species Act approvals for many projects. Andrew partaken in extensive in public and First Nations consultation on renewable energy projects. He has also appeared as an expert witness at several renewable energy Environmental Review Tribunals. ESA.

Post-construction Monitoring Programs, Multiple Projects, Various Sites (Terrestrial Ecologist)

Post-construction monitoring of renewable energy projects is performed to assess the direct impacts to birds and bats and indirect impacts to breeding, migrating and wintering wildlife. The purpose of post-construction monitoring programs is to verify predictions of the pre-construction assessment and, if necessary, implement appropriate measures to mitigate adverse effects. Andrew has coordinated and conducted monitoring field studies including assessment of disturbance to grassland, forest and wetland breeding birds, staging waterfowl and shorebirds, tundra swans and wintering raptors and co-authored or authored the post-construction monitoring reports for many projects in Ontario. Andrew has also contributed to post-construction monitoring programs in Manitoba. Andrew's extensive post-construction experience includes over 20 projects with a combined capacity of over 1000 turbines and almost 2000MW of renewable power.

Residential Development

Crates Marina, Keswick, Ontario (Project Manager / Ecologist)

Environmental policies, approvals and design. Identification of natural heritage features and sensitive species.

Kortright East Development, Guelph, Ontario (Project Manager / Ecologist)

Environmental Implementation Report. Vegetation buffers, wildlife corridor, tree conservation plan, planning and design of invasive species removal, design of compliance and performance monitoring program.

Andrew Taylor B.Sc.

Senior Ecologist

Southeast Sutton Development Area Plan, Sutton, Ontario (Project Manager / Ecologist)

Environmental policies, approval and design. Identification of natural heritage features and constraints for Development Area Plan. Plan of Subdivision forest buffers, mitigation of impacts to forest resources, sensitive vegetation and Species at Risk. Participation in Ontario Municipal Board discussions.

Fourteen Mile Creek Development, Oakville, Ontario (Terrestrial Ecologist)

Natural Heritage Monitoring Program Director - directed monitoring program of vegetation communities, change in species composition, avian wildlife, aquatic Species at Risk, benthic invertebrate communities, hydrogeology, geomorphology and erosion.

Activa Waterloo East, Waterloo, Ontario (Terrestrial Ecologist)

Terrestrial and Aquatic Monitoring Program - monitoring of vegetation communities, changes in species composition and disturbance levels were undertaken, interpreted and reported. Directed monitoring of benthic invertebrate communities.

DEBRA GIESBRECHT

Ecologist

Debbie Giesbrecht M.Sc.

Terrestrial Ecologist
20 years of experience · Stoney Creek, Ontario

Debra is a Senior Terrestrial Ecologist with experience in the transportation, oil and gas and mining sectors. She has extensive experience in avian biology, technical report writing, survey techniques and protocols. Debra has participated in recovery planning for various avian species at risk, served on many species at risk management and recovery teams, developed, designed and implemented bird monitoring and stewardship programs, and provided scientific oversight, program design and delivery. Debra has strong skills in collecting, compiling, managing, analyzing and reporting field data for large study areas, as well as recruiting, training and supervising field crew members. In her previous role as Ontario Program Manager with Bird Studies Canada, she oversaw a multitude of bird monitoring, research, stewardship, education and outreach initiatives.

Debra is a strong communicator, and has overseen communications materials, prepared media releases, delivered public presentations, coordinated stakeholder workshops, and delivered media interviews. She is accustomed to collaborating with government, non-government, and industry partners, and is skilled at the efficient management of large projects and project budgets. Debra holds memberships in several committees and councils of various natural heritage organizations in both Canada and the United States, and has authored many scientific studies in peer-reviewed journals, and many technical reports including status updates for the Committee of Endangered Wildlife in Canada (COSEWIC).

EDUCATION

M.Sc., Trent University / Watershed Ecosystems Graduate Program, Peterborough, Ontario, Canada, 2001

B.Sc. (Hons.), Ecology and Evolution (Area of Concentration in Environmental Science), University of Western Ontario / Environmental Science, London, Ontario, Canada, 1996

CERTIFICATIONS & TRAINING

Standard First Aid with CPR C + AED, St. John Ambulance, Hamilton, Ontario, 2018

MEMBERSHIPS

Member, Society of Canadian Ornithologists
Councillor (2008-2012), Society of Canadian Ornithologists
Member, Ontario Field Ornithologists
Member, Bird Studies Canada
Member, The Ontario Road Ecology Group
Member, American Ornithologists' Union

PROJECT EXPERIENCE

ENDANGERED SPECIES/SPECIES AT RISK ASSESSMENTS

Various Projects

Prepared construction phase mitigation plans for Blanding's Turtle, Barn Swallow and Massasauga Rattlesnake; registered SAR projects under O Reg. 242/08 of the Endangered Species Act; prepared Bobolink Habitat Management Plans.

Wildlife Ecology | Multiple Sites, Ontario

Familiar with all Ontario wildlife with expertise in terrestrial Species at Risk. Experience conducting field work for birds, amphibians, turtles, snakes and bats. Strong knowledge of life-history, habitat requirements and population threats for Ontario wildlife species.

Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures | Multiple Sites, Ontario

Lead author on this document which was prepared for the Ministry of Natural Resources and Forestry.

Species at Risk | Multiple Sites, Ontario

Extensive experience with federal and provincial Species at Risk, including field identification and monitoring, design and delivery of monitoring programs, recovery planning, and permits/authorizations under the Endangered Species Act. Developed research projects to address habitat requirements for Species at Risk, including Chimney Swift, Barn Swallow and Bank Swallow. Developed mitigation plans and habitat management plans for SAR turtles, snakes and birds. Prepared Notice of Activity forms and Information Gathering Forms.

NATURAL SCIENCES & HERITAGE RESOURCES

Bird Studies Canada (BSC)* | Port Rowan, Ontario | 2007-2013 | Ontario Program Manager

Oversaw all Ontario bird monitoring, research, stewardship, education and outreach initiatives in Ontario, including the Ontario Nocturnal Owl Survey, Bald Eagle Monitoring Program, SwiftWatch, Bank Swallow Project, Forest Birds at Risk, Great Lakes Marsh Monitoring Program, and the Bird Science and Education Program. Participated in recovery planning for Hooded Warbler / Acadian Flycatcher, Barn Owl, Chimney Swift, Golden-winged Warbler, Short-eared Owl, Whip-poor-will, Barn Swallow. Member of Hooded Warbler / Acadian Flycatcher Recovery Team, Southern Ontario Bald Eagle management team, Chimney Swift Recovery Team, Ontario Eastern Habitat Joint Venture Advisory Committee, Bank Swallow Working Group, and Barn Swallow Recovery Working Group. Developed, designed and implemented bird monitoring and stewardship programs, including scientific oversight, program design and delivery. Developed field research projects, analyzed data, and reported on findings to partner organizations. Delivered public presentations, coordinated stakeholder workshops, and delivered media interviews. Secured sufficient funding to support Ontario staff and meet administrative overhead targets through preparing funding proposals to foundations, government agencies, and corporations. Identified new opportunities for programs, and developed new partnerships and opportunities to increase revenue.

Bird Studies Canada (BSC)* | Port Rowan, Ontario | 1999-2007 | Bird Population Biologist

Analyzed bird migration data from across Canada to estimate bird population trends. Compiled bird data and prepared written site descriptions on Important Bird Areas in Canada. Coordinated summer field work for Hooded Warblers, which included nest searching, monitoring, mist netting, colour banding, vegetation sampling. Coordinated field work for Bald Eagles, which included nest access, blood sampling, banding, deployment of satellite telemetry units. Coordinated Ontario Nocturnal Owl Survey, Red-shouldered Hawk and Spring Woodpecker Survey, and Ontario Breeding Bird Survey. Managed and analyzed data, prepared technical reports and funding proposals.

Current Research Projects/Partnerships

Recipient of Stantec R&D Fund grant to investigate habitat selection of Barn Swallows at bridges and culverts in Ontario. Collaborative research project with Bird Studies Canada, Environment and Climate Change Canada and Ministry of Natural Resources and Forestry. Industry supervisor for an NSERC Industrial Post-graduate Scholarship. M.Sc. Student. Collaborative research project looking at movements of juvenile Bald Eagles from the lower Great Lakes. Partners: Bird Studies Canada, University of New Brunswick, Ministry of Natural Resources and Forestry.

ROADWAYS

Highway 401 Expansion, GWPs 3024-18-00, 3073-17-00, 3025-18-00, 3078-18-00, 3079-18-00, 3038-19-00 | MTO West Region | Tilbury to London, Ontario | 2019-present | Senior Terrestrial Ecologist

This project includes the preliminary design, environmental assessment and design build ready work to address the future needs of the Highway 401 corridor from Tilbury to London (129 km) within Chatham-Kent, Elgin, Middlesex, and London. The project has been broken down into six GWPs—four to focus on reconstruction and widening of Highway 401 from four to six lanes, and two to focus on interchange improvements. The terrestrial discipline includes study design, mitigation recommendations, impact assessment, and Species at Risk approvals.

Preliminary Design, Detail Design and Class Environmental Assessment for 145 Culvert Rehabilitation/Replacements | MTO | Multiple Sites, Ontario | 2013-2017 | Senior Ecologist

Senior Reviewer, prepared Species at Risk Mitigation Plan, Notice of Activity Form for Ministry of Natural Resources and created Species at Risk Factsheets for Barn Swallow and Massasauga.

Highway 6 Little Current Swing Bridge, Planning, Preliminary Design and Class EA Study, GWP 5268-14-0 | MTO Northeastern Region | Manitoulin Island, Ontario | 2018-present

The purpose of the EA for replacement of the Highway 6 Little Current Swing Bridge is to identify a Recommended Plan to address current and future transportation needs at the bridge crossing. Field data were collected at four alignment alternatives to document existing conditions and the information was used to and assess the sensitivity and potential impacts, including consideration of the design alternatives (crossing type), for each alignment. Coordinated field data collection for terrestrial resources and authored the Existing Conditions report for the project.

Detail Design and Class Environmental Assessment Highway 24 from Brant Road 5/Blue Lake Road to Glen Morris Road | MTO | County of Brant, Ontario | 2014-2016 | Terrestrial Ecologist

Coordinated and performed the site investigations including a road mortality study. Author of Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Provided recommendation for wildlife enhancements to reduce wildlife mortality and enhance habitat connectivity. These included the installation of large culverts, funnel fencing and the creation of artificial nesting habitat.

Large Value Retaine | MTO West Region | Southwestern Ontario | 2018-2020 | Natural Sciences Quality Reviewer

Under the terms of a three year Retainer Agreement for Highway Engineering and Other Services Throughout West Region (Agreement 3017-E-0004/0005, 3017-E-0006/0007), many of the individual assignments had a natural sciences component. The terrestrial ecosystems reports documented existing conditions, assessed site sensitivities and impacts of the contract and recommended environmental mitigation measures.

Detail Design and Class Environmental Assessment Highway 401 Reconstruction | MTO | Multiple Sites, Ontario | 2014-2017 | Senior Ecologist

Contributing author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Senior Reviewer and advisor for the project. Preparation of mitigation plans and ESA authorizations.

Agreement 4015-E-0033: Preliminary Design Retainer Services | MTO Eastern Region | 2016-2020 | Senior Ecologist

Lead author for preliminary design and detail design study for carpool lots expansion at Highway 417 (interchange 79) and Highway 416 (interchange 57), including terrestrial resources and SAR. Senior Reviewer for Class EA preliminary design study for the future widening of Highway 401 from Cobourg to Colborne, involving the replacement and rehabilitation of structures, interchange modifications, and commuter parking lot expansions, including terrestrial resources and SAR.

Detail Design and Class Environmental Assessment Replacement of South Saugeen River Bridge | MTO | County of Grey, Ontario | 2017-2018 | Senior Ecologist

Prepared existing conditions and impact assessment report, conducted site visit to document existing conditions.

Detail Design and Class Environmental Assessment Highway 400 North Canal Overpass Replacement | MTO | County of Simcoe, Ontario | 2016-2019 | Senior Ecologist

Senior Reviewer for existing conditions and impact assessment report.

Environmental Retainer Services, East Region | MTO | Multiple Sites, Ontario | 2016-2018 | Senior Ecologist

Lead author of existing conditions and impact assessment reports.

MUNICIPAL

Heart Lake Road | City of Brampton | Brampton, Ontario | 2017-2018 | Senior Terrestrial Ecologist

Gathered background information; lead author on report which describes the existing conditions including high levels of road mortality.

Dundas Street Road Widening and Grade Separation | Regional Municipality of Halton | Halton, Ontario | 2016-2019 | Senior Terrestrial Ecologist

As Discipline Lead, conducted field work, performed background review, completed bat habitat assessment for SAR, prepared impact assessment report, consulted with MNRF to obtain SAR authorizations.

Regional Road 25 Municipal Class Environmental Assessment | Regional Municipality of Halton | Halton, Ontario | 2018-2019 | Senior Terrestrial Ecologist

Lead author for Natural Environment report.

Bramalea Road (Queen Street to South City Limit) Municipal Class Environmental Assessment | City of Brampton | Brampton, Ontario | 2018-2019 | Senior Terrestrial Lead / QA/QC Reviewer

TRANSPORTATION PLANNING

Municipal and Provincial Road Improvement Projects | Various Sites, Ontario | Terrestrial Ecologist

Collected wildlife and wildlife habitat data, including Species at Risk, determined potential impacts and mitigation options, contributed to preliminary design route selection and detailed design, prepared technical reports.

OIL AND GAS PIPELINES

Energy East Pipeline | Trans Canada Pipelines | 2013-2015 | Ontario Wildlife Discipline Lead

Prepared Environmental and Socioeconomic Assessments for the National Energy Board for 104 km of new build pipeline, and 30 pump stations across Ontario; designed and implemented field programs; managed data and reporting.

MINING

Eagle River Proposed Tailings Management Facility | Wesdome | Wawa, Ontario | Senior Terrestrial Ecologist

Species at Risk approvals for Woodland Caribou and Eastern Whip-poor-will, senior QC review of baseline reports.

De Beers Tango Extension of Victor Mine | De Beers | Hudson Bay Lowlands, Ontario | Project Manager

Designed and implemented a bird monitoring project in consultation with the client using autonomous recording devices to meet Environment Canada's new guidelines for bird monitoring at mining sites. Prepared reports for client; supervised collection of data.

PUBLICATIONS

Badzinski, D., B. Holden, S. Spisani and K. Richardson. Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Bridges and Structures. Ontario Ministry of Natural Resources. *Queen's Printer for Ontario*, 2017, pp. 22.

Fitzgerald, T.M., van Stam, E., Nocera, J.J. D.S. Badzinski. Loss of nesting sites is not a primary factor limiting northern Chimney Swift populations. *Population Ecology* 56, 2014, pp. 507-512.

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- Heagy, A., D. Badzinski, D. Bradley, M. Falconer, J. McCracken, R.A. Reid and K. Richardson. Recovery Strategy for the Barn Swallow (*Hirundo rustica*) in Ontario. Ontario Recovery Strategy Series. *Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario*, 2014, pp. vii + 64.
- COSEWIC assessment and status report on the Bank Swallow *Riparia riparia* in Canada. *Committee on the Status of Endangered Wildlife in Canada*, 2013, pp. ix + 48.
- Tozer, D.C., C.M. Falconer, and D.S. Badzinski. Common Loon reproductive success in Canada: the west is best but not for long. <http://dx.doi.org/10.5751/ACE-00569-080101>. *Avian Conservation and Ecology* 8(1):1, 2013.
- Walpole, A., J. Bowman, D. Tozer, and D. Badzinski. Community level response to climate change: shifts in anuran calling phenology. *Herpetological Conservation and Biology* 7(2):249-257, 2012.
- COSEWIC assessment and status report on the Hooded Warbler *Setophaga citrina* in Canada. *Committee on the Status of Endangered Wildlife in Canada. Ottawa*. x + 39 pp, 2012.
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- Bowman, J., D.S. Badzinski, R.J. Brooks. The numerical response of breeding Northern Saw-whet Owls (*Aegolius acadicus*) suggests nomadism. *Journal of Ornithology* 151:499-506, 2010.
- Badzinski, D.S., P.E. Nye, and E. van Stam. NATAL DEPARTURE AND NOMADIC MOVEMENTS OF JUVENILE BALD EAGLES IN THEIR FIRST YEAR OF INDEPENDENCE. Presentation. *American Ornithological Union and Society of Canadian Ornithologists Joint Meeting, San Diego, CA*, 2010.
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- Melles, S.J., D.S. Badzinski, M.J. Fortin, and K. Lindsay. Differentiating between habitat and social drivers of clustered nesting patterns in territorial songbirds. *Landscape Ecology* 24:519-531, 2009.
- Badzinski, D.S. LONG-TERM PATTERNS IN HOODED WARBLER NEST SUCCESS IN SOUTHERN ONTARIO. Poster Presentation. *Cooper Ornithological Society, American Ornithological Union, and Society of Canadian Ornithologists Joint Meeting, Portland, OR*, 2008.
- COSEWIC assessment and update status report on the Red-shouldered Hawk *Buteo lineatus* in Canada. *Committee on the Status of Endangered Wildlife in Canada. Ottawa*. vi + 27 pp, 2006.
- Badzinski, D.S. Five Species Accounts (2001-2005): Hooded Warbler, Northern Saw-whet Owl, Boreal Owl, Barn Owl, Red-shouldered Hawk. *Atlas of the Breeding Birds of Ontario. Cadman, M.D., D.A. Sutherland, G.G. Beck, D. LePage, and A.R. Couturier, eds*, 2005.
- Invited Plenary Presentation. Society of Canadian Ornithologists Annual Meeting, Winnipeg, MB. *Badzinski, D.S. The power of people - engaging citizens in bird and habitat conservation.*, 2013.
- Calvert and D.S. Badzinski. Population dynamics of a Neotropical migrant at the edge of its range. Oral Presentation. *Society of Canadian Ornithologists Annual Meeting, Moncton, NB*, 2011.
- Falconer, M., and D.S. Badzinski. ARE BANK SWALLOW POPULATIONS ERODING AWAY? Oral Presentation. *5th North American Ornithological Conference, Vancouver, BC*, 2012.
- Fitzgerald, T., J. Nocera, E. van Stam, and D. Badzinski. Is habitat limiting the Chimney Swift population in Ontario? Oral Presentation. *Society of Canadian Ornithologists Annual Meeting, Winnipeg, MB*, 2013.
- Giesbrecht, D.S. The effects of predation risk on foraging behaviour: an experimental study of birds at feeders. *Baccalaureate Thesis*, 1996.
- Giesbrecht, D., and C.D. Ankney. Predation risk and foraging behaviour: an experimental study of birds at feeders. *Canadian Field Naturalist* 112(4):668-675, 1998.
- Badzinski, D.S. The recovery of Bald Eagles in southern Ontario. *Bird Trends* 9:19-21, 2003.
- Badzinski, D.S. Population trends of Red-shouldered Hawks in Ontario. *Bird Trends* 9:17-18, 2003.
- Badzinski, D.S. Population trends of nocturnal owls in Ontario. *Bird Trends* 9:41-45, 2003.
- Naujokaitis-Lewis, I., J. Curtis, I. Tischendorf, D. Badzinski, K. Lindsay, and M.J. Fortin. Predicting metapopulation dynamics at the range margin while accounting for uncertainties in coupled species distribution-metapopulation dynamics models for risk assessments under climate change. *Diversity and Distributions* 19:541-554, 2013.
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- Badzinski, D.S. Population dynamics of Semipalmated Plovers (*Charadrius semipalmatus*) breeding at Churchill, Manitoba. *Masters Thesis*, 2001.

AMBER GARRETT
Water Resources Engineer

Amber Garrett

P.Eng., CAN-CISEC

Water Resources Engineer
6 years of experience · Waterloo, Ontario

Amber is a Water Resources Engineer with Stantec Waterloo's River Services group. Amber graduated from the University of Guelph with a Bachelor of Engineering in Water Resources Engineering, and has been working for Stantec since March, 2016. Prior to her employment with Stantec, Amber completed educational work terms across Ontario in both the public and private sector to broaden her engineering experience.

Amber has experience performing a variety of tasks for a diverse range of projects. She has completed geomorphic assessments, stream designs, hydrologic and hydraulic modelling studies of culverts and bridges, erosion and sediment control plans and inspections, drainage design for roadways, the design of stormwater management facilities, Low Impact Development (LID) testing and design, permit application preparation, and drafting specifications for stream restoration tenders. Amber also assists with post-construction monitoring programs for stream restoration projects and stormwater facilities.

EDUCATION

B.Eng., Water Resources Engineering, University of Guelph, Guelph, Ontario, 2016

Rosgen Level 1, Seeley Lake, Montana, 2018

Rosgen Level 2, Asheville, North Carolina, 2019

Rosgen Level 3, Alta, Wyoming, 2019

River Mechanics / University of Waterloo, Waterloo, Ontario, 2017

CERTIFICATIONS & TRAINING

CAN-CISEC 0598, CISEC, Aurora, Ontario, 2018

MEMBERSHIPS

Engineer, Professional Engineers Ontario

PROJECT EXPERIENCE

STREAM/RIVER RESTORATION

Idlewood Creek Dam Removal and Stream Restoration | City of Kitchener | Kitchener, Ontario, Canada | CAD 1.9M

Idlewood Creek, which discharges into the Grand River in Kitchener, contained a dam with a gabion lined outlet channel to the Grand River at the downstream end, a small dam 1 km upstream, and a perched culvert at an old road crossing 150 m upstream of that. The two dams, crossing, and outlet channel were removed, and using Natural Channel Design (NCD) principles, 360 m of Idlewood creek was realigned. The new sections of Idlewood Creek have reduced erosion, improved fish passage, and maximized fish habitat using structures such as wood toe protection and log and boulder riffles. In addition to the channel works an important connection of the Walter Bean Trail was made. Involved in various phases of design and construction. Performed full-time construction inspection for channel and trail works. Performed erosion and sediment control inspections. Held bi-weekly construction meetings.

Laurel Creek Bank Stabilization | Waterloo, Ontario

Performed construction inspection and supported construction administration for the stabilization of 1 km of channel banks along Laurel Creek for the City of Waterloo. The project involved determining the most at risk creek banks and properties along the creek and developed solutions to provide long term stability without increasing flood elevations. Project phases included assessment, design, permitting, tendering, and construction.

Water Crossing Management Program | Enbridge (formerly Union Gas) | Ontario

Involved in the geomorphic assessments and depth of cover surveys of Enbridge pipelines to determine the scour potential at watercourse crossings across Ontario. The project included directing surveys crews to produce a transect of the pipeline as well as watercourse cross-sections upstream and downstream of the pipeline location to be used in hydraulic modelling of the watercourse. Geomorphic assessments for this project included the completion of a Wolman Pebble Count for coarse soils or torvane shear test for cohesive soils, Rapid Geomorphic Assessment (RGA), and a standard fluvial geomorphology form to document channel form, bank and bed characteristics, and stability (BEHI).

Confidential Creek Realignment | Niagara Falls, Ontario

Greater than 1700 m of a creek within the City of Niagara Falls is to be realigned to allow for the development on the proposed site. Prepared the design of a realigned meandering watercourse with in-stream structures, habitat features, and riparian wetlands. Performed an erosion threshold assessment to ensure construction activities would not endanger the morphology of the existing watercourse.

Mathers Stream Channel Restoration | London, Ontario

A tributary to Dingman Creek flowed through a proposed residential development as a tile drain structure. As part of the development, approximately 300 m of tile drainage and 650 m of tiled channel was restored to natural open channel. Provided tender assistance, including writing specifications for in-stream structures and other construction requirements, researching city and provincial standard specifications, and preparing a budget and form of tender. Involved in various aspects of stream construction including construction administration, erosion and sediment control inspections, and fish rescues.

Little Red River Bank Stabilization | Prince Albert, Saskatchewan, Canada

Following the installation and removal of a dam for an emergency water supply for the City of Prince Albert, the Little Red River experienced disturbances to the banks. Performed Site visits to inspect the damage, identify priority areas for restoration, and complete a topographic survey to be used for a geomorphic analysis. Created a bank stabilization design incorporating wood debris toe protection structures using wood sourced from the City's landfill, point bar grading to ensure floodplain access, and re-established trails and vegetation that had fallen into the river. Prepared the tender document for construction, and developed a prequalification system for potential contractors. On Site for construction administration, and worked with the inexperienced contractor to ensure it was built according to the design. The topographic survey was performed using a survey grade GPS, survey data was analyzed using RiverMorph software, and AutoCAD Civil3D was used in the design process.

Shipp Lands - Milton Menkes Industrial Lands | Milton, Ontario

Two small watercourses on Site were relocated to accommodate industrial development. On Site during construction for contract administration and erosion control inspection. Set up and performed the post-construction geomorphic monitoring protocol.

Conlin Road Widening and Oshawa Creek Realignment | Oshawa, Ontario

The City of Oshawa realigned and widened Conlin Road. As part of the construction, it was necessary to realign Oshawa Creek. Oshawa Creek was realigned and restored using Neural Channel Design(NCD) methods. Involved in post-construction monitoring including site inspection (photo documentation, geomorphic survey of longitudinal profile and designed riffles and pools using survey grade GPS) and reporting on the stability of the realigned channel with respect to the designed channel.

Black Creek Channel Reconstruction | Comox Valley, British Columbia

The remediation of 105 m of Black Creek was necessary after a trucking incident approximately 100 meters south of Hamm Road on Highway 19 resulted in a release of diesel. Following a geomorphic assessment of the site, the data was analyzed using RiverMorph and AutoCAD Civil3D to create a new channel alignment and slope that would tie into the existing channel. Morphological parameters obtained during the reference reach survey were used to determine cross-section and planform geometry of the rehabilitated channel.

Brierwood Creek Realignment | Woodworth, Manitoba

Excessive erosion along an outer bank of a meander loop of Brierwood Creek caused significant slope failure along the embankment of Rural Road 133 W. As part of the overall slope remediation, a 151 m section of channel was realigned employing Natural Channel Design principles. Provided tender assistance, including writing specifications for in-stream structures and other construction requirements, researching city and provincial standard specifications, and preparing a budget and form of tender.

Victoria Park Village Subdivision | Guelph, Ontario

As part of the proposed subdivision, Torrance Creek was diverted around several ponds that were remnants of a previous golf course. The channel design incorporated a meandering pattern and contained structures such as riffles, pools, woody debris toe protection, constructed log riffles, and log vanes with rock j-hooks. Provided tender assistance, including writing specifications for in-stream structures and other construction requirements, researching city and provincial standard specifications, and preparing a budget and form of tender.

WATER RESOURCES MANAGEMENT

Post-Construction Monitoring | Ontario | Multiple Sites, Kitchener-Waterloo

Performed a variety of monitoring tasks such as water quality sampling of SWM facilities, groundwater level measurements, SWM facility forebay sediment measurements, and the installation of data loggers including the retrieval of data to monitor drawdown times of SWM ponds and infiltration galleries. Post-construction monitoring was performed on the following projects:

- Waterloo Westside (Greyerbiehl, Clair Creek Meadows, Vista Hills)
- University of Waterloo Northwest
- Woolwich Estates
- Lunor Elmira
- Hidden Valley
- Creekside
- Activa Conservation Drive
- Knoll Property
- Carriage Crossing

Grandview Ravines Subdivision | Brantford, Ontario

Conceptual design of stormwater management measures to provide erosion control, water quantity control, and water quality control for an 8 hectare site. The design included a conveyance swale and gave the option of stormwater management wet pond or wetland facility discharging to an adjacent Provincially Significant Wetland.

Meadows in the Glen | Halton Hills, Ontario

Performed single ring infiltrometer testing (SRIT) of recently maintained permeable paved driveways and walkways within the Meadows in the Glen subdivision. 10% of the driveways, and 3 locations along the walkways within the development were tested to ensure they met the infiltration criteria set by the town of Halton Hills.

Veteran's Memorial Parkway Detailed Highway Drainage Design | London, Ontario

Completed an inventory and evaluation of all centerline, entrance, interchange and side road culverts. Delineated catchment areas for each culvert. Conducted hydrologic and hydraulic modelling to develop design flows, determine waterway openings and to assess the hydraulic impacts of infrastructure. Particle sizing and shear analysis of the Crinklaw Drain was performed to ensure bed stability over a temporary steep transition. Recommendations were incorporated into construction drawings.

Union Gas Pipeline Construction | Hamilton to Milton, Ontario

Prepared a Stormwater Management Brief documenting the methodology and assumptions used in determining appropriate design flows and proposed culvert dimensions for watercourse crossing locations. 13 water crossings requiring permits for pipeline construction activities were analysed.

Wind Farm Access Road Culvert Design | Niagara Region, Ontario

In response to complaints of inadequate drainage, a culvert sizing analysis of the T38 access road crossing was completed. A technical memo was prepared outlining the assumptions and hydrologic parameters used in determining design flows, the hydraulic analysis, and a series of recommended culvert options.

Hazeldean LID Analysis | Stittsville, Ontario

A Low Impact Development (LID) based stormwater management design was investigated for a 2.98 ha site in Stittsville, ON. The site included a 185 unit independent living apartment complex, a 256 unit long-term care facility, and associated parking and landscaped areas. A green infrastructure water balance design spreadsheet was used to calculate runoff and infiltration for the site for the pre- and post-development conditions. This was used to determine how a treatment train of LID measures (infiltration gallery, rain garden, and rainwater tank) would perform to provide peak flow control. A continuous hydrologic model was also used to determine erosion impacts post-development.

Structural Culvert Rehabilitations/Replacements | Multiple Sites, Ontario

Detail design services for the rehabilitation or replacement of structural culverts and drainage improvements on various highways in southern Ontario. Hydrologic and hydraulic analysis was completed for culvert replacements and culverts with major changes to the culvert geometry. Groundwater and surface water dewatering rates for construction were determined from the results of hydrologic and borehole studies of the site locations, and if required, a Permit to Take Water (PTTW) was acquired. Amber has been a project team member for the following projects:

- Mega North Contract 3 – Highway 11, GWP 6212-14-00, replacement and rehabilitation of 4 structures in northwestern Ontario
- Mega North Contract 4 – Highway 619 and Highway 621, GWP 6327-14-00, replacement and rehabilitation of 3 culverts in northwestern Ontario
- Mega Culvert Contract 4 – Highways 3,6,9,10,21,23, and 89, GWP 3042-11-00, replacement and rehabilitation of 27 culverts in southwestern Ontario

Salt Management Plans | Region of Waterloo, Ontario

Completed Salt Management Plans (SMPs) as required by the City of Guelph and the Region of Waterloo. SMPs include recommended salt application rates, operation procedures, site drainage design strategies, alternative ice control products, snow storage, source protection planning, and an adaptive monitoring program to be used by site owners and winter maintenance contractors for the following projects:

- Conestoga Meat Packers, Ontario
- 85 Mullin Drive, Guelph, Ontario
- Victoria Park Village, Guelph, Ontario
- 280 Wesley Boulevard, Cambridge, Ontario