

November 13, 2020

Our File: OWA 1120

### **Anthony Francis: Summary of Expertise**

#### *Turtles*

Dr. Francis has managed/conducted numerous surveys for various turtle species including Blanding's Turtles (*Emydoidea blandingii*), Snapping Turtles (*Chelydra serpentina*), and Painted Turtles (*Chrysemys picta*). The surveys were completed to support a variety of projects including planning for hydroelectric dam renew near Sudbury, and preparation of new aggregate resource areas, infrastructure development and repair, and land development of residential and commercial subdivisions around eastern Ontario. Where turtles were found to be present, Dr. Francis developed mitigation plans to prevent impacts turtles during the proposed work and/or advised on suitable habitat compensation projects to allow the projects to proceed.

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

Dr. Francis has worked with agencies and industry in developing best practices mitigations and site-specific mitigations for works around water. Dr. Francis, with other staff at Kilgour & Associates, developed operational statements that guided in-water works practices for projects not requiring Authorization. For OWA and DFO, Dr. Francis with other staff at Kilgour & Associates, developed mitigation for a variety of in-water works activities including dewatering, site isolation, moorings, cofferdam installation, in-water repair, bridge construction, culvert installation, shoreline stabilization and dredging.

For Environment Canada, Dr. Francis updated the aquatic habitat portions of the "How Much Habitat is Enough?" guidelines (third edition), which provide guidance to both industry and conservation in defining setback requirements for development works along waterways.

#### *Expertise and Experience in the hydroelectric sector*

Dr. Francis has conducted baseline studies and assessments for hydroelectric facilities in Ontario. He has participated in field programs to develop detailed inventories of aquatic species and habitats around - and has served as a co-author on the environmental assessments for - the Lorne Falls GS bypass upgrade and the Nairn Falls GS replacement. For those projects, he has assisted in studies documenting water quality, sediment quality, benthic invertebrates, fish communities and populations, mercury levels in sportfish, fish habitat suitability, and species at risk (birds, bats, fish, turtles).

Anthony Francis, PhD

Senior Ecologist

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Attachments: Curriculum Vitae

## Anthony Francis, PhD

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Dr. Francis is a Senior Ecologist with 20 years' consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives. He has extensive experience in preparing Environmental Impact Statements, Integrated Environmental Reviews and Tree Conservation Reports in support of land development and property severances. He has carried out literature reviews for government agencies, performed complex geospatial analyses of plant and animal distributions, and completed numerous field programs in support of environmental impact statements and assessments.

### EDUCATION

- BSc, University of Ottawa, Biology, Ottawa, Ontario, 1994
- BEd, University of Ottawa, Ottawa, Ontario, 1995
- PhD, University of Ottawa, Biology, Ottawa, Ontario, 2003

### EMPLOYMENT HISTORY

- Kilgour & Associates, Ottawa, ON, Associate (2008 to present)
- Waterwood Consulting, Ottawa, ON, Senior Consultant (2000 to 2008)
- University of Ottawa, Institute of the Environment (2003 to 2005)

### TRAINING AND COURSES

- Ontario Wetland Evaluation System
- CISEC Certified Erosion Sediment Control Inspector
- Class 1 Electrofishing Crew Leader
- Ecological Land Classification
- MTO Fisheries Protocol Training for Fisheries Specialists

### PROJECT EXPERIENCE

#### Policy

##### **Significant Woodland Policy (2019)**

*As a member of the Builder Developer Council for the Greater Ottawa Home Builders Association, Dr. Francis sat on the Natural Heritage Sub-committee and played an active role in*

*negotiations between area builders and the City of Ottawa on the development and application of City policy for Significant Woodlands as per the new 2014 Ontario Provincial Policy Statement. Both the City and area builders sought to establish a policy framework that would allow important woodland areas to be efficiently protected but without imposing prohibitive restrictions on all future development options.*

##### **OPG Best Management Practices (2013)**

*For the Department of Fisheries and Oceans, Dr. Francis supervised the updating and revision of BMPs for waterpower maintenance projects.*

##### **DFO Best Management Practices (2012)**

*For the Department of Fisheries and Oceans, Dr. Francis supervised the updating and revision of DFO BMPs for works near fish habitat including work in water, excavation, dredging, culvert construction and bridge maintenance.*

##### **Review of the Riparian Habitat Guidelines in How Much Habitat is Enough? (2011)**

*Dr. Francis reviewed and revised Environment Canada's draft of their third edition of the Riparian portion of the Riparian and Watershed Habitat Guidelines. This review included the production of an extensive compilation of current peer-reviewed published scientific literature and relevant unpublished reports describing interactions between riparian and stream habitats to support the updated guideline framework.*

## **Ecology and Environmental Assessment**

### **Species-at-Risk and City Infrastructure Planning (2016 & 2018)**

*Dr. Francis provided the assessment and mitigation planning for species at risk for all City of Ottawa infrastructure renewal projects planned in 2016 and again for 2018 (450+ projects per year related to road resurfacing/restructuring, culverts, bridges, parks and pathways, etc.).*

### **Environmental Impact Statements (2011-2020)**

*An EIS provides a detailed inventory of natural heritage features on or adjacent to a site subject to development and specifies mitigation measures required to minimize impacts to those features. EIS studies for commercial and residential developments include reports for: Dadashi Construction, Lawrence Associates, Trinity Development Group, Simplicity Developments, Avenue 31, Parkbridge, Morguard, Domicile, Rollin Developments, Trimterra, Minto, Caivan, Karson, Taggart and Mattamy. EIS projects have also been completed for properties on National Capital Commission-owned lands, which require full consideration of both provincial and federal regulations.*

### **Headwater Drainage Feature / Fish Habitat Risk Assessments (2011-2019)**

*An HDFA evaluates small, surface-water features according to hydrology, riparian condition, fish and amphibian populations and habitat, and terrestrial habitat. The protocol identifies the overall functionality of the feature to the watershed providing a more complete summary of the importance of the feature than an FHRA. Dr. Francis supervised fieldwork and authored reports for: Domicile, Caivan, Mattamy, Minto, Taggart, Heafey Group and Avenue 31.*

### **Species at Risk Assessments (2011-2020)**

*Species at risk assessments begin with desktop reviews of site habitat potential and*

*communications with government agencies. Appropriate species surveys (birds, fish, vegetation, amphibians, and/or reptiles) are planned and coordinated by Dr. Francis, then executed by him and/or other KAL associates. Dr. Francis has been responsible for studies including: the Andrews Subdivision in Beckwith Township, the Ottawa River Shoreline at Parliament for the NCC, Peterborough Municipal Airport, the Carp Road Widening, Mattamy's Bisson Lands and Karson's gravel pit expansions.*

### **Butternut**

*Dr. Francis is a registered Butternut Health Assessor for the province of Ontario. He has conducted Butternut surveys and, where required, developed compensation plans for Butternut on development sites around Ottawa. He has negotiated, on behalf of clients, the terms of the compensation.*

### **Integrated Environmental Review**

*An IER provides a detailed summary of all environmental studies supporting a property development to distill a complete yet concise set of environmental constraints and required mitigations for the development project. IER reports written and supervised to date include: Mattamy's Dawson Lands, Minto's Arcadia, South Kanata Development Corporation's Monahan Landing and Mattamy's Summerside Communities.*

### **Ottawa International Airport Authority - Federal Species at Risk Act Surveys (2015)**

*Served as field lead and lead report author for an assessment of habitat and species presence and associated development constraints across airport lands in Ottawa to support an update of the Airport Master Plan.*

### **Agnico Eagle - Meadowbank (2014)**

*Characterized aquatic environments (benthic invertebrates, fish and fish habitat, sediment*

chemistry) for the Meadowbank Mine EEM program.

**Mattamy Bisson Lands Environmental Management Plan (2013)**

Dr. Francis co-wrote an Environmental Management Plan with DSEL supporting a residential development in Ottawa's east end. The EMP describes existing natural features in an area for which a subwatershed study is not available. It evaluates the impacts of development on natural features, provides direction to mitigate adverse effects, and identifies measures to protect, enhance or restore the natural system elements to the extent possible.

**Vale - Shebandowan (2013)**

Assisted with the development of the study design for the Shebandowan Mine EEM program, and the delivery of the field monitoring components including fisheries, benthos, and sediment and water chemistry. (Thunder Bay)

**Cambrian Woods Forest Management Plan (2012)**

Managed and contributed to the field program to describe a woodland area to be preserved by the City of Ottawa as an urban natural area. Dr. Francis was the lead author on the final report providing management recommendations to both protect and enhance the feature while providing community access to it.

**Blanding's Turtles Mitigation Minto Arcadia (2013-2014)**

Supported negotiations between the Kanata West Owners Group and the OMNR to define Blanding's turtle habitat within the Carp River corridor as part of an extensive river restoration process. Work included habitat mapping based on fieldwork and air photo interpretation, and winter surveys for hibernating turtles.

**Spanish River Fisheries Study (2011 - 2016)**

Collected Lake Sturgeon and Walleye from the Spanish River, in addition to sediments and benthic macroinvertebrates. Studies were carried out to support future upgrades to dams and a powerhouse on the river, and to address data gaps for species at risk assessment.

**Bobolink Compensation Plan (2012)**

Developed a compensation plan losses of Bobolink habitat resulting from the development of an urban area in Ottawa. Negotiated, on behalf of the client, the terms of the compensation, and the drafting of the agreement.

**Benthic Invertebrate and Fish Habitat Inventory, Oshawa Harbour (2011)**

As a subcontract to Franz Environmental, managed and contributed to the collection of baseline data, and wrote the summary study reports supporting the construction of a new pier into Lake Ontario for the City of Oshawa.

**Benthic Invertebrate, Fish and Fish Habitat Inventory, Wilket Creek (2010)**

Data collected as baseline prior to the City of Toronto commencing repair work to sewer network and stream crossings along the length of the creek. (Toronto).

**Benthic Community Assemblage Monitoring, Vale/Inco Junction Creek (2010, 2012)**

Benthic invertebrate sampling and fish habitat assessment in Sudbury Ontario was carried out. Artificial habitat for invertebrates placed and retrieved for analysis. (Sudbury)

**Fish Habitat Risk Assessment, Shenkman Exhibition Park Project (2010)**

Fisheries habitat was assessed for a proposed exhibition development area near the Ottawa International Airport.

**Regional Aquatics Monitoring Program Benthic Program (2010)**

## Anthony Francis, PhD

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*Dr. Francis was involved in inventory of the benthic invertebrate community assemblage in the Athabasca River watershed around Fort McMurray Alberta. Invertebrates were collected using kick and Hess sampling techniques and water quality was assessed in rivers surrounding the oil sands in Fort McMurray, AB.*

### **Timminco (2010, 2011)**

*Dr. Francis took regular water samples from a site potentially impacted by mine effluent and from an upstream reference site in support of an environmental effects monitoring program.*

### **Peterborough Airport EA (2010)**

*Dr. Francis was a key team member in producing a federal Environmental Assessment supporting the expansion of the Peterborough Municipal Airport. Dr. Francis conducted extensive fieldwork and GIS-based desktop studies examining: fish habitat, wetland habitat, ecological land classification and species at risk.*

### **Duncan Creek Restoration (2009-2010)**

*Characterized terrestrial (ELC of riparian corridor) and aquatic environments (benthic invertebrates, fish and fish habitat) in support of the restoration of Duncan Creek (Toronto).*

### **Karson Aggregates- Survey of Ontario Endangered Species Act Listed Species (2009-2010)**

*Dr. Francis carried out field-based and GIS-based studies of the potential presence of species at risk and their key habitats on lands slated for open pit gravel extraction.*

### **Taylor Massey Creek Restoration (2009)**

*Characterized aquatic environments (benthic invertebrates, fish and fish habitat) in support of the restoration of Taylor Massey Creek (Toronto).*

### **Highland Creek Restoration (2009)**

*Characterized aquatic environments (benthic invertebrates, fish and fish habitat) in support of the restoration of Highland Creek (Toronto).*

### **Totten Mine EEM (2009, 2012)**

*Assisted with the development of the study design for the Totten Mine EEM program, and the delivery of the field monitoring component, and final report.*

### **Berry Creek Restoration (2008-2009)**

*Characterized terrestrial (ELC of riparian corridor) and aquatic environments (benthic invertebrates, fish and fish habitat) in support of the restoration of Berry Creek (Toronto).*

### **Mattamy Orleans – The Orchard (2008-2010)**

*Mapped fish and fish habitat, and terrestrial landscape in support of tree conservation planning using both field study and GIS-based approaches in support of land redevelopment. Prepared reports supporting an OPA amendment.*

### **Mattamy Richmond Lands Natural Environment & Impact Assessment Study (2008-2009)**

*Developed a constraints analysis for a proposed 300+ ha urban development in Richmond, Ontario, taking into consideration aquatic setbacks based on erosion thresholds and fish habitat, floodplain mapping, and significant woodlands. Constraints were developed within a GIS environment with extensive associated fieldwork on terrestrial and aquatic habitat ecology.*

### **INVISTA EEM (2008)**

*Dr. Francis was a team member conducting benthic samples in a bay adjacent to a chemical plant and from several nearby reference sites in support of an environmental effects monitoring program. (Kingston).*

### **Barrhaven South Compensation Pond (2008-2010)**

## Anthony Francis, PhD

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*For Mattamy Homes, and in support of Mattamy's requirements under a DFO Authorization, monitored the biological community of a fish habitat pond that was constructed as compensation for the losses of fish habitat on development lands in the south end of Ottawa.*

### **Fish Species Inventory, Rideau River (Project Scientist 2000)**

*As a member of the Rideau River Biodiversity Project, an initiative of the Canadian Museum of Nature to identify all species inhabiting the Rideau River watershed, Dr. Francis surveyed fish communities enumerating species by trapping, seining, and electrofishing the river proper and its stream tributaries from Black's Rapids to Merrickville.*

### **Environmental Assessment of an underwater logging operation, Syrotech Global (Project Leader 1998-1999)**

*Dr. Francis co-lead a project assessing the environmental impacts of log salvage operations on the Gatineau and Ottawa Rivers. He advised the proponent of necessary mitigation, designed follow-up monitoring and conducted laboratory and statistical analyses of suspended sediment loadings. This work was featured in Canadian Geographic.*

## **Construction Monitoring and Support**

### **Water Quality Monitoring Programs for Mattamy (2011-present)**

*Managed site inspections and monitoring programs for compliance with Permits to Take Water, ECAs/C of As for stormwater management ponds, and CA permits to alter waterways for Mattamy residential development projects at Fairwinds, Summerside, Halfmoon Bay, Abbottsville and Black Stone.*

### **Water Quality Monitoring Program for Capital Exhibition Centre Construction (2011)**

*Managed site inspections and monitoring programs for compliance with the project Permit to Take Water and C of A during site construction.*

## **Education, Communications and Research**

### **Electrofishing Course (2013)**

*For the South Nation Conservation Authority, Dr. Francis trained and certified CA staff as Class 2 Backpack Electrofishing Crew Leaders.*

### **Literature Review of Cumulative Impacts to Georgian Bay (2012)**

*For the Department of Fisheries and Oceans, Dr. Francis provided a literature review providing an overview of the cumulative impacts to fish habitat and general water quality within the southern half of Georgian Bay.*

### **Invasive Species Report for CFB Petawawa (2009)**

*For the Department of National Defense, Dr. Francis provided a literature review of invasive species distributions in proximity to the CFB Petawawa to assess potential threats to species at risk on federal property and military operations.*

### **Road Salt Case Studies (2008)**

*For Environment Canada, wrote six case studies documenting best practices for road salt management in Canada, and which will appear on Environment Canada's Road Salt web site.*

### **Peer Review of the NAESI Final Reports (2008)**

*Assisted in the management of the peer review of the final reports for the National Agri-Environmental Standards Initiative (NAESI).*

### **Literature review, Little Red River Cree Nation (2003)**

*Dr. Francis compiled and wrote a literature review of current forestry and forestry management practices pertaining to aspen silviculture in Northern Alberta, in preparation of the band's pursuit of forestry business opportunities.*

### **Developed a training program for the City of Chelsea PQ (2003-2004)**

*Dr. Francis prepared and delivered training workshops on surface water quality assessment for volunteers of the H2O Chelsea program, a citizen's initiative to ensure safe water supplies for the municipality.*

### **Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports (2002)**

*Dr. Francis co-wrote and published two update status reports on threatened fish species: margined madtom, (*Noturus insignis*) and channel darter, (*Percina copelandi*). Extensive research and consultations with senior fish scientists from across Canada were undertaken.*

### **Website development, Department of Fisheries and Oceans (2001)**

*Dr. Francis co-wrote the Freshwater and Habitat Management components of the Big Blue Bus children's website, a DFO initiative to interest and educate children on fisheries and fish habitat issues.*

### **Program development, Canadian Museum of Nature (2001)**

*Dr. Francis co-wrote and developed a travelling museum exhibit showcasing the biodiversity of the Rideau River.*

## **Statistics and Geomatics**

### **Evaluation of the sensitivity of the Canadian Water Quality Index to High Flow Events (2009)**

*Dr. Francis completed a study looking at the sensitivity of the Canadian Water Quality Index to extreme flow events, and the consequences to the index of removing extreme events using data trimming techniques.*

### **Development of a priority list for species at risk studies on native reserves (Project Scientist 2004-2005)**

*As part of an initial response by Indian and Northern Affairs Canada to the Species at Risk Act, Dr. Francis produced a coarse resolution quantitative assessment of the habitat availability for species at risk on native reserves across Canada.*

### **Development of a Rapid Estimation Technique (Project Scientist 2004-2005)**

*Dr. Francis devised a rapid assessment technique for the Ontario Ministry of Natural Resources to estimate Ontario Wetland Evaluation System scores for Ontario wetlands using remote sensed and existing vector data. This work was part of a total reevaluation OWES.*

### **Production of empirical models of contaminant distributions (Project Scientist 2003)**

*For Jacques Whitford, Dr. Francis constructed empirical models of contaminant metals distributions in the Town of Port Colborne as part of a large-scale human health and environmental risk assessment.*

### **Computer programs and database scripts, University of Ottawa (Research Consultant 2003)**

*For a study of temporal changes in bird species populations across North America, Dr. Francis was contracted to design and write custom software for geomatic and statistical analysis of Breeding Bird Survey data.*

### **Broad-scale habitat analysis (Project Scientist 2002)**

## Anthony Francis, PhD

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*Through Seburn Ecological Services, Dr. Francis was subcontracted to produce a database mapping species at risk to ecoregions as part of an Environment Canada initiative prior to the passing of the Species at Risk Act.*

### **Statistical analysis and advice for studies related to the production of medical devices (Consultant 2000-2001)**

*For MDS Nordion Inc., Dr. Francis provided expert statistical advice conducting analyses and data trending for a cleanroom monitoring program and evaluating the statistical protocol of validation procedures.*

### **Other Work and Experience**

#### **Technical Editor, Blackwell Publishing (2007-2013)**

*Dr. Francis evaluated the final drafts of submissions to the peer-reviewed journal *Global Ecology and Biogeography*. He was responsible for editing scientific manuscripts for accuracy and clarity.*

#### **Lecturer, University of Ottawa (2000-2009)**

*Dr. Francis taught undergraduate courses at the University of Ottawa in biology and ecology including a fourth-year level environmental science field course covering Ontario Ecological Land Classifications and Markov projections of forest succession.*

### **PUBLICATIONS**

Kilgour, B.W., Somers, K.M., Barrett, T.J., Munkittrick, K.R. and Francis, A.P. 2017. Testing against "normal" with environmental data. *Integrated Environmental Assessment and Management*. 13(1) 188-197

Kilgour, B.W., A.P. Francis, and V. Mercier. 2012. Reducing the Sensitivity of the Water Quality Index to Episodic Events. *Water Quality Research Journal of Canada*

Currie, D.J. and A.P. Francis. 2004. Regional versus Climatic Effect on Taxon Richness in Angiosperms: Reply to Qian and Ricklefs. *The American Naturalist*. 163(5):780–785

Francis, A.P. and D.J. Currie. 2003. A globally consistent richness-climate relationship for angiosperms. *The American Naturalist*. 161(4):523-536

Phelps, A., and A. Francis. 2002. Update COSEWIC status report on the margined madtom, *Noturus insignis* in Canada. Committee on the Status of Endangered Wildlife in Canada.

Phelps, A., and A. Francis. 2002. Update COSEWIC status report on the channel darter, *Percina copelandi* in Canada. Committee on the Status of Endangered Wildlife in Canada.

Currie, D.J., A.P. Francis, and J.T. Kerr. 1999. Some general propositions about the study of spatial patterns of species richness. *Ecoscience*. 6(3):392-399

Francis, A.P. and D.J. Currie. 1998. Global patterns of tree species richness in moist forests: another look. *Oikos*. 81(3):598-602