

Troy Whidden, PhD, PBIOL
Principal Ecologist
Whidden Environmental Ltd.
<address and contact information removed>

Education:

- Ph.D. Ecology, 2003 (defended 2002), University of Calgary
- M.Sc. Biology, 1996, Acadia University
- Honours Conversion Diploma, 1994, Acadia University
- B.Sc. Biology, 1993, Acadia University

Accreditation & Training:

- Alberta Society of Professional Biologists – Director (2005-2007)
- Alberta Society of Professional Biologists – Professional Biologist
- Course Training: 'How to Select, Establish and Use Plants for Erosion Control'
- Course Training: 'An Introduction to the Canadian Environmental Assessment Act'
- Standard First Aid Training
- WHMIS Training
- Ground Disturbance Training
- Transportation of Dangerous Goods Training
- MS Office Access – Level 1

Work Experience:

- Principal – Whidden Environmental Ltd. (November 2003 – current)
- Project Coordinator, Northern Development Division – KAVIK-AXYS Inc. (May 2003 – November 2003)
- Group Leader & Project Manger, Contractor, Biophysical Services Division – Inuvialuit Environmental & Geotechnical Inc (August 2001 – May 2003)

Project Experience:

Audit and Review of Environmental Assessments and Regulatory Submissions

- Review of Suncor Energy Corporation's Voyageur South Project – project management, wildlife and regulatory setting review, and integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2008).
- Review of North American Oil Sands EIA (now owned by StatOil) – project management, wildlife review, regulatory setting review, and integration of First Nation issues of concern on behalf of the Chipewyan Prairie Dene First Nation, AB (2008).
- Review of Great Divide Oil Corporation's Algar SAGD Project – project management, wildlife review, regulatory setting review, and integration of First Nation issues of concern on behalf of the Chipewyan Prairie Dene First Nation, AB (2008)
- Review of PetroCanada's Fort Hills Project Amendment – project management, wildlife review, and integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2007-current).
- Review of Birch Mountain Resources Limited's Hammerstone Project – project management, wildlife review, and integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2006).
- Review of Synenco-SinoCanada Northern Lights Project – project management, wildlife and biodiversity review, integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2006).
- Review of Syncrude Canada Ltd's 2006 Application for Renewal and Aurora Update Report on behalf of the Mikisew Cree First Nation, AB (2007).

- Review of Imperial Oil Limited's Kearl Lake Project – project management, wildlife and biodiversity review, integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2006).
- Review of the proposed terms of reference for the Synenco-SinoCanada Northern Lights Project on behalf of the Mikisew Cree First Nation, AB (2006).
- Review of Suncor Energy's Steepbank Extraction Plant Application on behalf of the Mikisew Cree First Nation, AB (2005).
- Review of Shell Canada Limited's Muskeg River Mine Expansion Project – project management, wildlife review, integration of First Nation issues of concern on behalf of the Mikisew Cree First Nation, AB (2005-2006)
- Review of Canadian Natural Resource Limited's No Net Loss Compensation and Monitoring Plan on behalf of the Mikisew Cree First Nation, AB (2005).
- Provision of advisory services and review of an application made under Alberta's *Water Act* for a bridge construction project at Westlock Golf Course, Alberta (2005).
- Review of Suncor Energy's Landfill Amendment Application on behalf of the Mikisew Cree First Nation, AB (2005).
- Review of Suncor Energy's Firebag Waste Management facility Application and associated Conservation & Reclamation Plan on behalf of the Mikisew Cree First Nation, AB (2005).
- Review of the Wildlife components for Husky Energy's Sunrise Thermal Project EIA submission on behalf of the Mikisew Cree First Nation, AB (2004).
- Review of the proposed terms of reference for Husky Energy's Sunrise Thermal Project on behalf of the Mikisew Cree First Nation, AB (2004).

- Review of the Suncor's South Tailings Pond Project EIA on behalf of the Mikisew Cree First Nation, AB (2004).
- Review of the revised terms of reference for Imperial Oil's Kearl Oil Sands Project on behalf of the Mikisew Cree First Nation, AB (2003).
- Review and assessment of Suncor's Enhanced Thermal Solvent Project – Phase II EIA on behalf of the Mikisew Cree First Nation, AB (2003).
- Review of Alberta Transportation tender documents and environmental assessment reports with respect to requirements for wildlife for the SE leg of Anthony Henday Drive in Edmonton, AB (2003).
- Reviewed and provided Alberta Transportation specifications for wildlife culvert design for the SE leg of Anthony Henday Drive in Edmonton, AB (2003).
- Review of environmental impact assessments (wildlife, vegetation, biodiversity, and cumulative effects analyses) for oil sands (TrueNorth - Fort Hills, Shell - Jackpine Mine Phase 1, CNRL - Horizon) and hydroelectric developments (Canadian Hydro - Dunvegan Project) on behalf of the Mikisew Cree First Nation, AB (2002-2003).
- Integration and assessment of senior consultant reports from various scientific disciplines (air quality, water quality, hydrology, hydrogeology, and fisheries) used in the review of environmental impact assessments for oil sand developments on behalf of the Mikisew Cree First Nation, AB (2002-2005).
- Evaluation and review of wildlife habitat suitability index models from a biophysical assessment in north-eastern AB (2002).
- Senior review and assessment of the Diavik Diamond Mine Wildlife Effects Monitoring Report / Wildlife Effects Monitoring Program on behalf of the Daivik Diamond Mine Environmental Monitoring Advisory Board, NT (2003).
- Senior review of the preliminary Wildlife EIS for the Mackenzie Gas Project, NT (2003).

Facilitation and Communications/Advisory Services

- Expert witness testimony (Biodiversity-Wildlife) on behalf of the Mikisew Cree First Nation during the CEEA-AEUB Joint Review Panel hearing for Albion Energy Inc's Muskeg River Mine Expansion Project (2006).
- Participation in technical sessions and workshops for Imperial Oil Limited's Kearl Lake Project on behalf of the Mikisew Cree First Nation, AB (2006).
- Participation in the MD Foothills No. 31 Municipal hearing for the Sanctuary On The Bow development project on behalf of Sherbrooke Investments (2006)
- Provision of advisory services to Westlock Golf Club concerning an application under Alberta's *Water Act* (2005).
- Provision of wildlife and terrestrial ecology professional advisory services to Diavik's Environmental Monitoring Advisory Board, NT (2003-current).
- Participation in technical sessions and workshops for Shell-Jackpine Mine and CNRL-Horizon on behalf of the Mikisew Cree First Nation, AB (2002-2003).
- Preparation and editing of community bulletins to communicate industrial development activities to Aboriginal stakeholders in affected communities near Fort McMurray, AB (2002-2003).
- Group Facilitator at an Issues Scoping Workshop associated with a proposed offshore exploratory drilling project in the Inuvialuit Settlement Region, NT (2003).

Other Northern Canadian Experience

- Preparation of project Descriptions for the Inuvialuit Environmental Screening Committee (2001-2003).
- Senior review and QA / QC of impact assessment methods guidelines and baseline assessments for a proposed offshore development project in the Inuvialuit Settlement Region, NT (2003).
- Project management and scientific contributions to numerous regulatory applications to the Inuvialuit Environmental Impact Screening Committee associated with onshore drilling and seismic programs in the Inuvialuit Settlement Region, NT (2001 - 2003).
- Gathered and synthesized pertinent scientific literature and industry reports for an investigation into vegetation and soil disturbance effects for the Mackenzie Gas Project pipeline right-of-way preparation for ColtKBR (2003).
- Assessed potential impacts and cumulative effects of proposed oil and gas exploration projects in the Inuvialuit Settlement Region, NT (2001-2003).
- Designed protocol for selecting Valued Ecosystem Components in the Inuvialuit Settlement Region, NT (2001-2002).
- Constructed, evaluated, and reviewed wildlife habitat suitability index models for a biophysical assessment in the Inuvialuit Settlement Region, NT (2001-2002).
- Conducted vegetation community analyses with baseline data gathered in the Inuvialuit Settlement Region, NT (2001-2002).

Mining

- Assisted MSES Inc with the wildlife and vegetation impact assessment for Parsons Creek Resources Environmental Impact Assessment report. Duties included VEC selection, design and implementation of wildlife surveys, reporting and editing (2006-current).

- Assisted MSES Inc with a municipal land use designation application and future SML and EIA regulatory applications on behalf of a mining and aggregate resource extraction client in Alberta (2005).
- Assisted MSES Inc in the evaluation of a proposed transportation corridor associated with the Donlin Creek Gold Mine in Alaska, USA. Responsibilities included project scoping, budgeting, client liaising, designing and conducting field work, data analysis and interpretation of potential impacts to wildlife habitats (2005 - 2006).
- As part of a multidisciplinary team led by MSES Inc, evaluated and assessed proposed road access alternatives and potential impacts to wildlife for the Pebble Copper-Gold Mine in Alaska. This included evaluating and assisting with mapping wildlife habitat use and determining and studying the distribution and abundance of focal animal species (Valued Ecological Components or VECs) and vegetation community types. The objective at this stage of the project was to provide a Gap and Fatal Flaw Analysis of the project with respect to potential impacts to wildlife and wildlife habitat from road construction (2004)
- As part of a multidisciplinary team led by MSES Inc, assisted in developing the components of an Environmental Evaluation Document (EED) for the wildlife baseline, habitat mapping, and wildlife impact analysis for the PDUS Donlin Creek Gold Mine Project and road access options in Alaska. This included evaluating and mapping wildlife habitat use and determining and studying the distribution and abundance of focal animal species (Valued Ecological Components or VECs) and vegetation community types. The objective at this stage of the project was to consolidate all existing information and new research into a single EED to aid in the pre-NEPA phase of project evaluation. Meaningful, up-to-date and legally defensible conclusions drawn from what we found with respect to wildlife biological resources and for the level required for the pre-NEPA phase were provided (2004).

- Professional advisory service to the Diavik Diamond Mine Environmental Monitoring Advisory Board, NT regarding exclusion fence options for barren-ground caribou (2004).

Conventional Oil & Gas

- Design, supervision and implementation of a biophysical impact assessment of a sweet-gas well on the Stoney Indian Reserve (Olympia Energy), AB (2003).

Urban Planning

- Prime consultant for the completion of a Biophysical Impact Assessment for an industrial development in the Town of Cochrane, Alberta (IBI Group, 2006).
- Prime consultant for the completion of a Biophysical Impact Assessment for a housing development in the community of Silverado in SW Calgary (IBI Group, 2006).
- Prime consultant for the completion of a Biophysical Impact Assessment for a sustainable community development near the town of Chestermere, AB (IBI Group, 2006).
- Prime consultant for the completion of a Biophysical Impact Assessment for a housing development in the community of Sherwood in NW Calgary (IBI Group, 2005-2006).
- Provision of advisory services to Sherbrooke Investments regarding wildlife, wildlife habitat, and migratory birds in association with the development and design of the Sanctuary On The Bow community (2005)
- Provision of advisory services to Walton International Group regarding wildlife, wildlife habitat, migratory birds and wetlands in association with the completion of a BIA in NE Calgary (2005 - 2006)

- Prime consultant to provide of reconnaissance-level survey and due diligence advice with respect to the Migratory Bird Convention Act and construction activities at the interchange of Shaganappi Trail and the Trans-Canada Highway in Calgary, AB for Stantec Consulting (2004-2005).
- Prime consultant to conduct wildlife and Species At Risk (SAR) surveys in association with the Biophysical Impact Assessment led by Stantec Consulting for a proposed housing development in Symon's Valley, Calgary, AB on behalf of United Communities Inc (2005).
- Provision of reconnaissance-level survey and due diligence advice with respect to the Migratory Bird Convention Act and construction activities at the interchange of Stoney Trail and the Trans-Canada Highway in Calgary, AB for Stantec Consulting (2004).
- Bird survey for Kidco Construction Ltd. at the interchange of Stoney Trail and Country Hills Boulevard, Calgary, AB (2004).
- Tree inventory and assessment as required by the City of Calgary on the future site of St. Demetrius Serbian Orthodox Church on behalf of Challenger Surveys Ltd. (2003-2004).
- Project management of Rocky Ridge reclamation plans and soil profiling for IBI Group in the City of Calgary (2003).
- Provided technical review and background information with respect to wildlife and wildlife habitat for the extension of Nose Hill Drive in the City of Calgary for Carma Development Corp. and the City of Calgary (2002 – 2003).

Water Distribution Pipelines

- Prime consultant to provide professional services to Stantec Consulting Ltd. to ensure compliance with the Migratory Birds Convention Act during construction of the Linden-Irricana segment of the regional Kneehill water line (2005).
- Prime consultant to provide professional services to Stantec Consulting Ltd. to evaluate the likelihood of potential impacts to wildlife from the

construction of the Linden-North Water Distribution Pipeline, AB (2004 - 2005).

- Provision of reconnaissance-level surveys and due diligence advice to the Kneehill Regional Water Services Commission to ensure compliance with the Migratory Birds Convention Act during construction of the regional Kneehill water line, AB (2004).

Fieldwork Experience

- Design, implementation and management of amphibian surveys in southern and northern Alberta.
- Design, implementation and management of winter tracking surveys in northern Alberta.
- Design, implementation and management of ungulate pellet and browse surveys in northern Alberta.
- Design, implementation and management of wildlife sign surveys in southwestern Alaska, USA.
- Design, implementation and management of reconnaissance-level bird monitoring in southern Alberta.

Editing, Quality Assurance and Control

- Lead editor and writer of an Environmental and Regulatory Best Management Practices Chapter for the Canadian Heavy Oil Association Handbook (2004-2005).
- Acted as a scientific and technical editor / reviewer of numerous consulting reports including baseline assessments, environmental

protection plans, environmental impact screening reports, environmental overviews, wildlife habitat suitability indices, contaminated site assessments, and proposals (2001- current).

Academic Research

- Design and implementation of scientific investigations for a wide variety of animals and plants in maritime, prairie, badlands, and mountain ecosystems across Canada. The primary focus of this research was biodiversity at the genetic, population, and community levels (1996-2002).
- Holder of an Alberta Challenge Grant in Biodiversity while at the University of Calgary (1997-1998).
- Taught and designed university-level laboratory sessions in introductory and advanced zoology, botany, ecology and evolution, entomology, population ecology, invertebrate zoology, and applied genetics at Acadia University, NS and the University of Calgary, AB (1993 – 2002).
- Evaluated and implemented alternative pollination strategies for berry crops in NS and PQ (1995).

Publications, Co-authored Reports & Presentations:

Publications

Whidden, T.L. (Chairman). 2005. Environmental Chapter, Canadian Heavy Oil Association Handbook, Second Edition.

Otterstatter, M.C. and T.L. Whidden. 2004. Patterns of parasitism by tracheal mites (*Locustacarus buchneri*) in natural bumble bee populations. *Apidologie* 35: 2004.

Otterstatter, M.C.; T.L. Whidden and R.E. Owen. 2002. Contrasting frequencies of parasitism and host mortality among phorid and conopid parasitoids of bumble bees. *Ecological Entomology* 27: 229-237.

Whidden, T.L. 1996. The fidelity of commercially reared colonies of *Bombus impatiens* Cresson (Hymenoptera:Apidae) to lowbush blueberry in southern New Brunswick. Canadian Entomologist 128: 957-958.

Co-authored Reports (Partial List)

AES Lynx Enterprises Inc. 2005. 2005 Winter Wildlife Tracking Program for the PDUS Donlin Creek Project. Prepared for Placer Dome US Inc., Anchorage, Alaska, USA.

MSES Inc 2005. 2004-2005 Wildlife technical report for the PDUS Donlin Creek Project. Prepared for Placer Dome US Inc., Anchorage, Alaska, USA.

MSES Inc. 2005. Review of the No Net loss Habitat Compensation and Monitoring Plan for the Canadian Natural Horizon Project. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2005. A Review of Suncor Energy's Class II / III Industrial Landfill Application. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2005. A Review of Suncor Energy's Waste Management Facility Application. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

Whidden Environmental Ltd. 2005. Environmental and Regulatory Best Management Practices Chapter, Canadian Heavy Oil Association Handbook. T.L. Whidden, Editor.

IEG Environmental. 2004. Husky Sunrise EIA Review. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

AES Lynx Enterprises Inc. 2004. Iliamna Regional Transportation Corridor Analysis. Vol. II (Draft). Prepared for PND Inc, Anchorage, Alaska, USA.

AES Lynx Enterprises Inc. 2004. Donlin Creek Environmental Evaluation Document, (Internal Draft, Version 1). Prepared for Placer Dome US Inc, Anchorage, Alaska, USA.

Whidden Environmental Ltd. 2004. Bird Survey for the Stoney Trail-Country Hills Boulevard Interchange. Prepared for Kidco Construction Ltd., Calgary, Alberta, Canada.

MSES Inc. 2004. Review of the Husky Sunrise Thermal Project Proposed Terms of Reference. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2004. A Review of Suncor Energy's South Tailings Pond Project. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2004. Tree Inventory for the Future Site of St. Demetrius Serbian Orthodox Church. Prepared for Challenger Surveys Ltd, Calgary, Alberta, Canada.

Komers, P., E. Dickson, S. Kienzle, T. Whidden, and R. Levy. 2003. Cumulative Effects in the Oil Sands: A First Nation's Big Picture View. IEG. Calgary. Pp 27.

MSES Inc. 2003. Review of the Kearl Oil Sands Project Terms of Reference. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2003. Suncor Stage 3 Project Review. Prepared for the Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

MSES Inc. 2003. Review of the 2002 Diavik Diamond Mine Wildlife Effects Monitoring Report on Behalf of the Environmental Monitoring Assessment Board. Prepared for the Environmental Monitoring Advisory Board for the Diavik Diamond Project, Northwest Territories, Canada.

MSES Inc. 2003. A Review of RFQ and RFP (draft) for Southeast Anthony Henday Drive DBFO. Prepared for Millenium EMS and Alberta Transportation, Edmonton, Alberta, Canada.

MSES Inc. 2003. Anthony Henday Drive: Bridge and Culvert Issues of Concern for Wildlife. Prepared for Millenium EMS and Alberta Transportation, Edmonton Alberta, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. Vegetation classification and wildlife habitat suitability modelling in the Mackenzie Delta region. Prepared for Oil & Gas Producers in the Northwest Territories, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. Biophysical assessment for the proposed extension of Nosehill Drive, NW. Prepared for Carma Developers Limited, Calgary, Alberta, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. General review of the EIA and SIR for the Dunvegan Hydroelectric Project (Submitted by Glacier Power Limited). Prepared for The Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. An assessment of the review of the Fort Hills EIA (Submitted by TrueNorth Energy Limited). Prepared for The Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. A review of the Jackpine Mine – Phase 1 EIA (Submitted by Shell Canada Limited). Prepared for The Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

Inuvialuit Environmental & Geotechnical Inc. 2002. A review of the Horizon Oil Sands Project Application for Approval (Submitted by Canadian Natural Resources Limited) - Draft. Prepared for The Mikisew Cree First Nation, Fort Chipewyan, Alberta, Canada.

Presentations

Whidden, T.L. 2006. *Biodiversity-Wildlife*. Expert witness panel member presentation on behalf of the Mikisew Cree First Nation during the CEAA-AEUB Joint Review Panel hearing for Albian Energy Inc.'s Muskeg River Mine Expansion project (2006).

Whidden, T.L. 2002. *Patterns of molecular and morphological variation between bumble bee species: utility beyond systematics?* Annual Meeting of the Canadian Society of Zoologists, Lethbridge, Alberta.

Whidden, T.L. 2000. *The use of molecules and morphology in delineating bumble bee species*. Joint Annual Meeting of the Entomological Society of America and the Entomological Society of Canada, Montreal, Quebec, Canada.

Whidden, T.L.; M.C. Otterstatter and R.E. Owen. 1999. *Bumble bees and dipteran endoparasites*. Entomological Society of Canada Annual Meeting, Saskatoon, Saskatchewan, Canada.

Whidden, T.L.; M.C. Otterstatter and R.E. Owen. 1998. *Incidence of endoparasites in a population of bumble bees*. Entomological Society of Alberta Annual Meeting, Kananaskis, Alberta, Canada.