Penn Energy - Edwardsburgh_Morrisburg-1 SOLAR ENERGY FACILITY

In the Township of EDWARDSBURGH/CARDINAL

FIT Contract No. F-000628-SPV-130-505 FIT Application No. FIT-F46NQGB COD: April 2012

Water Assessment

DRAFT

Prepared for: Penn Energy Renewables Ltd. 620 Righters Ferry Road, Bala Cynwyd, PA 19004

Prepared by: Bowfin Environmental Consulting 168 Montreal Road, Cornwall, ON K6H 1B3

April 2011

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1.0 INTRODUCTION

Penn Energy Renewables Ltd. (Penn) has executed a Feed-in-Tariff (FIT) contract with the Ontario Power Authority (OPA) for the construction of a 10 MW (peak AC) solar energy facility near the Town of Prescott (Figure 1). The subject lands are located in part of Lots 34 and 35 Concession 1 of the Township of Edwardsburgh/Cardinal former Township of Edwardsburgh. The proposed Renewable Energy Generation Facility (REGF) would consist of a collection of solar photovoltaic (PV) modules (each approximately 1 m x 1.67 m in dimension) that are grouped into arrays tilted and facing south. These stationary arrays are strung together forming a series of rows oriented east to west. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REA) under Part V.0.1 of the act, per Ontario Regulation 359/09. As part of this act, a Water Assessment (WA) is required in order to identify water bodies in and within up to 300 m of the proposed project location. Bowfin Environmental Consulting Inc. (Bowfin) has been retained by Penn to conduct the WA.

A water assessment study includes two activities: a <u>review of records</u> (background information), and a <u>site investigation</u>. The records review includes the identification of the presence of a water feature that is within 120 m (or 300 m of a lake trout lake) from the REGF project location. These water features include:

- a water body;
 - o lake;
 - o permanent or intermittent stream; or
- seepage area.

Should any water feature be found within the REGF project location or the appropriate adjacent lands, then a report that identifies and assesses any negative environmental effects of the project on the water body/ies is required (Water Body Report).

The following report provides a summary of the records review and site investigations and identifies if a Water Body Report is required.





Figure 1 Location of the Subject Lands

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Figure 2 Study Area Boundaries





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2.0 METHODOLOGY

2.1 Records Review

The records review was conducted in order to identify potential environmental concerns and included identifying water features within the study area. The water features examined were: water bodies, lakes (including lake trout lakes), permanent and intermittent streams, and seepage areas. Background information was requested from the Kemptville District of the Ontario Ministry of Natural Resources (OMNR) and South Nation Conservation (SNC) and provided to Bowfin by Penn (Appendix A). Coordination meetings were also held with SNC and OMNR on July 26th, and September 8th 2010, respectively. Numerous records related to water bodies were searched and analyzed, including those maintained by OMNR, the Crown in right of Canada and the local conservation authority such as: Natural Heritage Information Centre (NHIC), Land Information Ontario (LIO), Ontario Renewable Energy Atlas, Conservation Ontario, Edwardsburgh/Cardinal Official Plan (OP). This study area is not located within the jurisdiction of any planning boards, municipal planning authority, local roads boards, local services board or the Niagara Escarpment Plan.

2.2 Site Investigation

The site investigation was conducted by <u>visiting the site</u>. The purpose of the site investigation was to confirm the presence, location and boundary of any candidate water body feature identified during the records review. The site investigation also determined if any other water body features were present within the study area. The study area includes the portion of subject lands where any construction activities, including support facilities and staging areas, would take place (the "REGF Project Location") as well as all adjacent lands within 120 m for all features with the exception of lake trout lakes where the study area was enlarged to include 300 m from the REGF project location (Figure 2). During the site investigation visit the records review mapping was corrected through ground truthing. Ground truthing consisted of systematically cruising the study area during spring and summer to identify and describe all water features.

Resumes of the key personnel are provided in Appendix B.



2.3 Habitat Description

The definition of water body under the REA legislation is:

"a water body includes a lake, permanent stream, an intermittent stream and a seepage area but does not include: grassed waterways, temporary channels for surface drainage, rock chutes and spillways, roadside ditches that do not contain a permanent or intermittent stream, temporarily ponded areas that are normally farmed, dugout ponds or artificial bodies of water intended for the storage, treatment or recirculation of runoff...."

The definition of a permanent stream is:

"...those that continually flow during an average year."

and the definition for an intermittent stream is:

"... natural or artificial channels, other than dams, that carry water intermittently and are free from vegetation dominated by plant communities that require or prefer the presence of water or continuously saturated soil to survive."

No definition of lakes is provided in the REA document; as such, the *Ontario Wetland Evaluation System* definition was used:

"Areas of open water that are greater than 8 ha in size and at some location are greater than 2 m in depth from the normal low water mark"

These definitions were utilized to identify the presence of water bodies. Habitat descriptions were based on the appropriate methodologies such as: *Ontario Wetland Evaluation System, Southern Manual* (OWES) for wetland habitats and *Environmental Guide for Fish and Fish Habitat* (MTO 2006) for watercourses. Data collected included information on morphology, substrate, structure and in-water cover and aquatic flora and fauna.

Field notes are included in Appendix C.



2.4 Fish Community Sampling

Fish community sampling was performed in order to provide information on the use of the habitat by fish and to supplement data obtained during the records review. Minnow traps were utilized on July 14th and 15th 2010. The fish were identified, counted, measured and released. Fish were measured using fork lengths (FL) (total lengths (TL) for species without a forked tail).

Field notes are included in Appendix C.

Note: Since fish and fish habitat are federally regulated (under the jurisdiction of DFO), detailed findings are not part of this report.



3.0 RECORDS REVIEW

The proposed REGF Project Location is in the Township of Edwardsburgh/Cardinal to the East of the Town of Prescott. The site is bordered by the CN railway to the north, County Road #2 to the south, and natural areas to the west and east. The St. Lawrence River is located immediately outside of the 120 m adjacent lands. The habitat within the study area consisted primarily of fallow fields and wooded areas that were historically used for grazing. No named watercourses were located on or within 120 m of the REGF project location. There are active railroads located in the northwest corner of the study area as well as abandoned railways and several dirt and overgrown roadways primarily on the west side of the study area. A summary of the records review results pertaining to the presence of potential water bodies in the study area is provided in Table 1 and illustrated in Figure 3 as applicable. This study area is not located within the jurisdiction of any planning boards, municipal planning authority, local roads boards, local services board or the Niagara Escarpment Plan.

Water Feature	On or Adjacent to REGF Project Location?	Records Review Findings
Lakes	No	 No lakes within 120 m of the REGF project location. No lake trout lakes are within 300 m of the REGF project location. The OP identified the small quarry pond located to the south of Highway 2, outside of the REGF project location. Satellite imaging identified a wayside pit on the north side of the study area and a small wetland on the south central side.
Permanent Streams		• None were identified on the OP.
Intermittent Stream	Unknown	 Railways and old trails may have associated ditches. Requires site investigation.
Seepage area	Unknown	• Requires site investigation.

Table 1	Summary of Water Bodies Located within the REGF Project Location or the
Adjacent Lan	ds (<u>based on the records review</u>)

OP = official plan of Edwardsburgh/Cardinal, June 2010









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4.0 SITE INVESTIGATION RESULTS

Site investigations were completed on May 4th, June 8th, and 11th and July 6th, 14th and 15th 2010. A total of 20 man hours were spent on site collecting water features data (Table 2). Site investigations were completed by Michelle Lavictoire and Shaun St. Pierre.

Resumes are provided in Appendix B.

Date	Start time	End time	Staff	Total No. of Staff Hours	Average Air Temperature (min-max) °C	Comments
May 4, 2010	0930h	1600h	Olaren O' Diarra	8	6.0-18.9	Overcast in the morning with little wind. Clearing mid day. Thunderstorm at 1600 hours
June 8, 2010	0900h	1615h	Michelle Lavictoire	4	8.4-19.0	Overcast with sunny breaks
June 11, 2010	0900h	1330h		2	7.6-22.5	Sunny with scattered clouds, slight wind
July 6, 2010	0500h	1100h		4	21.0-33.2	Sunny, no wind
July 14, 2010	1430h	1530h	Shoup St Diarra	1	18.0-28.2	Sunny, no wind
July 15, 2010	1145h	1245h	Shaun St.Pierre	1	16.2-30.4	Sunny, no wind

Table 2Summary of Dates, Times of Site Investigations

Shaun St.Pierre – Shaun St.Pierre: B. Sc and Fisheries and Wildlife Technologist Michelle Lavictoire – Michelle (Nunas) Lavictoire: M. Sc.

Min-Max Temp taken from: Environment Canada. 2010. National Climate Data and Information Archive -Brockville Climate Ontario [Online] Available: <u>http://www.climate.weatheroffice.gc.ca</u> [December 10, 2010].





Figure 4 Location of Water Bodies

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4.1. East-West CN Railway Line Ditch

This ditch was located outside of the REGF project location. This portion of the CN railway line had ditches dug in some areas but not in others resulting in a seasonal¹ and intermittent roadside ditch. Within the study area there was no ditch dug on the north side of the tracks. On the south side of the tracks there was a dug ditch which began east of the study area and flowed towards the west (Figure 3). The length of the dug ditch in the study area was 100 m, after which the railway bed was much higher than the adjacent lands and no ditching was needed to direct the flow from the tracks. The water from the dug ditch made its own natural path along the edge of the tracks and gradually fell away from the railway eventually carving a small seasonal drain. This drain continued for approximately 140 m within the study area and another 325 m outside of the study area where it drained into a ponded area. There was no outlet to the ponded area. These areas are described below.

The ditch was vegetated throughout with aquatic species. The average channel width of the dug ditch was 116 cm. The ditch was seasonal, only containing water during rain events or freshets. The substrate within the ditch was fines over gravel that fell in from the railway bed. <u>Aquatic vegetation was dominated by reed canary grass, grass sp., and purple loosestrife.</u>



Photo 1 Looking west along the railway ditch, aquatic vegetation is growing within this seasonal channel, May 5th, 2010.



¹ seasonal – indicating that water was only present during spring freshet or heavy rain events.

The seasonal drain had an average channel width of 40 cm and the bank height <5 cm. The substrate was composed of fines. Aquatic vegetation was dominated by reed canary grass, grass sp., and purple loosestrife.

The ponded area located <u>outside of the study area</u> was present throughout the field season. There was no outlet to the ponded area.

This ditch and ponded area did not provide fish habitat due to the lack of water and connectivity with fish habitat. No other fauna were observed using this area. This area was dry during the summer months.

<u>Conclusion</u>: This feature is <u>not</u> a water body.

4.2. North-South Railway Spur Ditch

This ditch was located outside of the REGF project location. The ditch was approximately 810 m long and it was not properly graded in that it did not consistently drain in any one direction. Furthermore, some areas did not contain any ditches or natural channels and could not be differentiate from the adjacent upland habitat. There was however a small intermittent seasonal ditch located on the east side of the railway (Figure 3). Again this ditch was not connected to any other water body and only contained a small amount of water during rain events. Aquatic vegetation included reed canary grass, willows, and speckled alder.



Photo 2 Looking north at the seasonal ditch with reed canary grass growing in the intermittent channel, May 5, 2010

Photo 3 Looking north at the seasonal ditches with reed canary grass, willows and alders growing in the intermittent channel, May 5, 2010



This ditch did not provide any fish habitat due to the lack of water, lack of connectivity and as it drained in various directions. No other fauna were observed using this area. These ditches were most often dry.

<u>Conclusion</u>: This feature is <u>not</u> a water body.

4.3. South Wetland

As indicated in the records review a small wetland was observed in the south central portion of the study area. The south wetland consisted of a tall shrub swamp that also had cattail, ground cover and low shrub layers. The site was isolated from any other water feature. A small swale was observed on the south side however this area was dry and did not lead anywhere. This wetland did not contain any open water habitat but did have water within the cattail community. By the summer, only a small portion of the cattails contained any surface water. Vegetation included willow, cattail, purple loosestrife and awl-fruited sedge, red-osier, meadowsweet and grey dogwood. There were no seepage areas associated with the wetland (no iron staining, no indicator plants such as water-cress and water temperature did not indicate the presence of groundwater).

Three baited minnow traps were placed within the wetted area, <u>no fish were captured</u> (effort was 21.5 hours/trap). Fauna observed included green frogs.

Conclusion: This feature is <u>not</u> a water body.



Photo 4 – Looking at the cattail marsh portion of the wetland, June 4, 2010



4.4 Site Investigations Including Confirmation of, Corrections/additions to Records Review Findings

Site investigations confirmed that there were no additional candidate water bodies within the project area and that no corrections or additions to the records review were necessary. Based on the REA definitions, there were <u>no water bodies</u> located within the study area (Table 3). All of the ditches observed were seasonal, intermittent ditches and contained "*vegetation dominated by plant communities that require or prefer the presence of water or continuously saturated soil to survive*". The small wetland did not contain any seepage areas.

5.0 CONCLUSION

The records review indicated that there were no lakes or lake trout lakes in or within 300 m of the REGF Project Location. The records review identified several areas that required site investigations to determine if water bodies, as defined by O.Reg. 359/09, were present in or within 120m of REGF Project Location. These areas were the ditches along the various railways and old trails and the small wetland in the south central area. Multiple site investigation visits were made. During these visits it was confirmed that there were no water bodies (lakes, permanent streams, intermittent streams or seepage areas) in or within 120 m of the REGF project location. <u>As such there is no need to complete a Water Body Report for this</u> **proposed solar facility.** A telephone conversation between MOE (district office) and Bowfin held on March 22nd, 2011, determined that no scoping meeting was warranted.



Table 3 Summary of Water Features Located within the REGF Project Location or the Adjacent Lands (based on the Site Investigations)

Water	Findings		Changes	On or
Feature	Records Review	Site Investigations	(corrections to records review and/or addition of new water body features)	Adjacent to Project Location?
Lakes	 No lakes within 120 m of the REGF project location. No lake trout lakes are within 300 m of the REGF project location. The OP identified the small quarry pond located to the south of Highway 2, outside of the REGF project location. Satellite imaging identified a wayside pit on the north side of the study area and a small wetland on the south central side. 	 No lakes within 120 m of the REGF project location. No lake trout lakes are within 300 m of the REGF project location. 	None	None
Permanent Streams	 None were identified on the OP. Railways and old trails may have 	• None were observed.	_	
Intermitte nt Stream	associated ditches.Requires site investigation.			
Seepage Area	• Requires site investigation.	• None were observed.	_	



6.0 **REFERENCES**

Bowfin 2011. Penn Energy Solar Energy Facility in the Township of Edwardsburgh/Cardinal Natural Heritage Assessment. Draft November 2010. Prepared for Penn Energy Renewable. 105 pp.

Ministry of Natural Resources. Ontario Wetland Evaluation System. Southern Manual. NEST Technical Manual TM-002. March 1993 (updated December 2002).

MTO 2006. Ministry of Transportation Environmental Guide for Fish and Fish Habitat.



Appendix A – Correspondence from OMNR and SNC



Tel: (613) 984-2948 • Fax: (613) 984-2872 • Toll Free: 1-877-984-2948 • 38 rue Victoria Street, Finch, ON KOC 1 KO • www.nation.on.ca

Via Email Transmission

Marc 22, 2010

Penn Energy Trust 620 Righters Ferry Rd Bala Cynwyd, PA, 19004 Attn: Robert Gray

> Re: Property Inquiry Potential Solar Farms Concession 1, Part Lots 34, 35 Township of Edwardsburgh/Cardinal Former Edwardsburgh Township

Dear Mr. Gray,

South Nation Conservation (SNC) received a property inquiry for the above location via email on March 8, 2010 from Penn Energy Trust.

It is SNC's understanding that the proposed project involves the potential development of solar farms at the above mentioned location.

SNC has reviewed the proposed project considering any potential environmental impacts and possible regulatory restrictions. The review consisted of an investigation of SNC Regulatory Mapping, Municipal Drain Reports, Natural Area Reports, MNR Base Maps, Aerial photos, and SNC inventory. We offer the following information:

Site Restrictions:

Ontario Regulation 170/06

It is the obligation of SNC to implement Ontario Regulation 170/06, *Development Interference with Wetlands and Alterations to Shorelines and Watercourses*, developed under Section 28 of the Conservation Authorities Act.

According to SNC's Regulation mapping, a section of the northern parcel does fall within the Regulated Area. The Regulation Limit is the result of several components, each of which addresses a specific hazard. The final Regulation Limit for each system is taken as the greater of the applicable hazard limits, plus a minimum 15 meter allowance.

Specifically, the Regulation Limit at the subject location has been determined as 15 metres from the top of bank of the watercourse. Therefore, SNC staff have determined that if any development and/or site alterations are proposed within the identified area, a permit will be required and restriction may apply.

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The following are brief descriptions of the Natural Heritage involved:

Fish Habitat

The northern parcel does contain a watercourse that has been identified in Schedule A2 of the Township of Edwardsburgh/Cardinal Official Plan as Fish Habitat. SNC recommends a 30 metre setback from the top of bank of the watercourse for any new development in order to reduce the risk of property damage and to protect fish habitat.

Significant Woodlands

All three parcels fall within or 50 metres adjacent to an area that has been identified in Schedule A2 of the Township of Edwardsburgh/Cardinal Official Plan as Significant Woodlands. SNC recommends that an Environmental Impact Assessment be prepared demonstrating that there will be no negative impacts on the natural features or on the ecological functions for which the area is identified. In addition, the Official Plan Policies of Section 5.1.7 (Significant Woodlands) state that any new development may be subject to an Impact Assessment where the development will require clearing, tree cutting, drainage works or waterway alteration in or adjacent to woodlands.

Endangered Species

The Ontario Ministry of Natural Resources' (OMNR) Biodiversity Explorer shows three historic or extirpated element occurrences in close proximity to the parcels in question. Specifically, the Honeylocust, the Heart-leaved Alexanders and the Puttyroot, all types of plants, are at high risk of extinction within the province but have a secure global population. OMNR should be contacted for further information.

I trust this document meets your requirements. Should you have any further questions or concerns, please contact our office.

Sincerely,

11/

Mathieu Leblanc Planning Assistant (613) 984-2948 ext. 303 <u>mleblanc@nation.on.ca</u>

SNC-713-2010















Ministry of Natural Resources

Kemptville District P.O. Box 2002 10 Campus Drive Kemptville, ON K0G 1J0

Tel.: (613) 258-8470 Fax.: (613) 258-3920 Ministère des Richesses naturelles

District de Kemptville CP 2002 10 Campus Drive Kemptville, ON K0G 1J0

Tél.: (613) 258-8470 Téléc.: (613) 258-3920

May 10, 2010

Penn Energy Trust LLC 620 Righters Ferry Road Bala Cynwyd, PA 19004 United States

Attention: Bob Gary

RE: Information Request – Solar Project – Edwardsburgh Parcels Our File No.: 2010_EDW-839

Dear Mr. Gray,

The Ministry of Natural Resources (MNR) Kemptville District has carried out a review of the area in order to identify any potential natural resource and natural heritage values in the area of the identified site – Concession 1, partial Lot 34 and 35, Edwardsburgh Geographic Township.

The MNR must clearly indicate that this is an initial records review and does not form part of the MNR review and confirmation process.

Our records review indicates that there is unevaluated wetland identified on portions of the lots. As these wetlands have not been evaluated, and with the presence of Species at Risk, the MNR strongly recommends that if works are proposed within these features or within the setback distance (120 meters) that the significance of these features be evaluated. Furthermore, portions of the lots are identified as woodland, and therefore have the potential to be Significant Woodlands. Under the Provincial Policy Statement (PPS) and the Planning Act, the identification and delineation of significant woodlands is a responsibility of the Municipality. The MNR recommends that you contact the municipality and review their Official plan to determine if they have identified this area as such. If Significant Woodlands are not identified in the Official Plan, the proponent is required to evaluate the significance of the feature in accordance with MNR guidance if works are proposed within the feature or the setback distance (120 meters).

There are some watercourses located on the property and a small waterbody. MNR has identified these areas as potential for fish and fish habitat. It is important to work with the Conservation Authority and the DFO with regards to identifying and protecting fish habitat. Certain works adjacent to or in water may require various permits from these other agencies or the MNR.

Lastly, the MNR oversees the provincial Endangered Species Act (2007) and thus following a review of the information obtained from Natural Heritage Information Centre (NHIC) and a search of SAR records which exist at the MNR Kemptville District office, the MNR can advise that there is a high potential for **Butternut** (Endangered Species) and **American Ginseng** (Endangered), as well as known occurrence records for provincially tracked rare species – Honey Locust, Puttyroot and Heart-leaved Alexander. While provincially tracked rare species are not protected by the Endangered Species Act, under the PPS, the identification of

Bowfin Environmental Consulting Inc. April 20, 2011



Significant Wildlife Habitat is (like Significant Woodlands) a delegated responsibility of the municipality. As such, if Significant Wildlife Habitat is not identified by the Municipality, the proponent is required to evaluate the significance of the feature.

Although this data represents the MNR's best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no Species at Risk (SAR) at the location. The MNR continues to encourage ecological site assessments to determine the potential for other SAR occurrences. When a SAR does occur on a proposed site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for application of certain permits (Section 17) or agreement (Regulation 242/08). For specific questions regarding the Endangered Species Act (2007) or species at risk, please contact Species at Risk Biologist, Paula Norlock at <u>paula.norlock@ontario.ca</u>. Not only is the ecological site assessment vital for assessing those Species at Risk on and adjacent to the site, however, it can also serve as the foundation for evaluating Significant Habitat of Endangered and Threatened species within the identified study area.

For the purposes of the required Natural Heritage Assessment report, the MNR recommends the following sources of direction and information as areas by which to begin the desktop portion of your review:

- Natural Heritage Reference Manual (2010) the newly published NHRM is a key document for understanding the importance of and the criteria for evaluating the various Natural Heritage Values on the landscape (including Significant Woodlands). This document can be accessed via: http://www.mnr.gov.on.ca/en/Business/LUEPS/Publication/249081.html
- Significant Wildlife Habitat Technical Guide (1999) this document provides further technical direction and information as it relates to Significant Wildlife Habitat: <u>http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html</u>
- Ontario Wetland Evaluation System: http://www.mnr.gov.on.ca/en/Business/Biodiversity/2ColumnSubPage/STEL02_176756.html

If you have any questions, please do not hesitate to contact me.

Sincerely,

Lama Mel:

Laura Melvin A/ District Planner Resource Management Planner <u>laura.melvin@ontario.ca</u>



Appendix B – Resumes

MICHELLE L. (NUNAS) LAVICTOIRE, M. Sc.

EDUCATION

M.Sc. Natural Resources, Environmental Assessment of Best Management Practices for Cattle Pasturing near Small Streams, Macdonald Campus, McGill University – Supervisor Dr. Curtis B.Sc. Wildlife Biology, Macdonald Campus, McGill University, 1997

LANGUAGES

Fluent in English, French, Spanish and novice Indonesian.

PROFESSIONAL AFFILIATIONS

American Fisheries Society (AFS), Ontario Association of Certified Engineering Technicians and Technologists (O.A.C.E.T.T.), Association Québécoise pour l'évaluation d'impacts (AQEI), International Association for Impact Assessment (AIAI), World Sturgeon Conservation Society.

POSITIONS HELD

2002-:	Bowfin Environmental Consulting Inc., Principal/Biologist
2000-2002:	Self-employed, Biologist
1999-2000	Tera Environmental Consultants, Calgary, AB, Environmental Planner
1998-1999:	Enviroconsult Inc. Calgary, AB, Biologist
1998:	Golder Associates Ltd., Calgary, AB, Contract Technician
1997-1998:	Envirowest Consultants Ltd., Prince George, BC, Biologist
1996:	Heritage Laurentien, Montreal, PQ, Naturalist
1996:	Martineau-Walker, Montreal, PQ, Naturalist
1995:	Ottawa-Carleton Wildlife Centre, Ottawa, ON, Wildlife Intern

CERTIFICATIONS/COURSES

OACETT rcjii Graduate Technologist, Class 1 WSC Electroshocking Certification, first aid, CPR, PADI Instructor, marine radio operator, Pleasure Craft Operator Card. Ontario Fishes course offered by the Centre for Biodiversity and Conservation Biology at the Royal Ontario Museum. Ontario Freshwater Mussel Identification Workshop, Ontario Wetland Evaluation Training, Ecological Land Classification, Butternut Health Assessor. MTO R.A.Q.S. Fisheries Assessment, Environmental Inspection during Construction and Fisheries Compliance during Contracts

EXPERIENCE

Experience in environmental assessments, peer reviews, terrestrial habitat assessment, freshwater and marine habitat assessment, route selection, watershed studies and terrestrial and fisheries inventories including habitat mapping, stream classification, underwater surveys, electroshocking, and development of mitigation and compensation measures, including obtaining extensions to OMNR in-water timing constraints and DFO Authorizations and DFO Permits for Killing Fish by Means other than Fishing.



Aquatic and Terrestrial Environmental Impact Assessments

- Completed EIS for proposed WPCP expansion in the Town of Greater Napanee, ON
- Currently working on a terrestrial and aquatic component for the evaluation of proposed small hydroelectric options for a Cree community in northern Quebec.
- Currently responsible for the aquatic component for the Cataraqui Bridge Crossing, Kingston, ON.
- Currently completing the aquatic and terrestrial assessments for the proposed Clear Point small hydroelectric facility in Renfrew, ON.
- Currently completing the aquatic and terrestrial assessments for three proposed solar farms located in Port Hope, Prescott and Martintown.
- Currently working on an aquatic assessment for a proposed quarry near Rockland, ON.
- Completed aquatic environmental impact assessment for proposed sand pit operations in Greely and Bourget.
- Completed an environmental assessment for a proposed development along Heb Gordon Drain, Manotick, ON.
- Evaluated wetland boundaries for Doran Creek Wetland following OWES, Iroquois Ontario.
- Evaluated wetland boundary and significant woodland features for several single lot developments in the United Counties of SD&G and City of Ottawa.
- Completed the Environmental Impact Statement for the route selection and the Environmental Impact Assessment for the preferred option for the Caron Street Expansion in Rockland, ON.
- Completed the aquatic impact assessment and terrestrial species at risk evaluation for a proposed expansion to a small hydroelectric facility in Douglas, ON.
- Completed terrestrial EIS for proposed WTTP expansion in Iroquois, ON.
- Completed a terrestrial and aquatic route selection assessment for the Simcoe WPCP.
- Completed a Level 1 and Level 2 aquatic and terrestrial assessments for a proposed quarry expansion near Cornwall, ON
- Completed Level 2 fisheries report for Gagne Pit expansion near Rockland, Ontario.
- Completed wetland assessment following OWES for the proposed Morrisburg Industrial Park
- Completed aquatic impact assessment for PTTW, Apple Hill Quarry.
- Currently working on Aquatic and Terrestrial Environmental Impact Assessments for First Chute small hydroelectric facility projects on the Bonnechere River, ON.
- Completed the aquatic habitat and community assessment for a permit to take water for the Amberwood Golf Course, Ottawa ON
- Complete fish community and habitat impact assessment for the Morrisburg Waste water tunnel
- Prepared aquatic impact assessment for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Created artificial reef design for the Town of Saugeen Shores WPP.
- Conducted assessment of fish habitat use and determined potential impacts for the Town of Saugeen Shores WPP.
- Developed and conducted a study to assess fish kills within the Town of Saugeen Shores WWP.
- Fish habitat assessment along Stagecoach Road, Ottawa ON.
- Complete aquatic habitat and community impact assessment for a permit to take water for the Summersheights Golf Course.
- Prepared impact assessment and monitoring plan for the Burloak Water Purification Tunnel project (Burlington, ON).
- Completed aquatic habitat and community assessments for the permit to take water for the Riverbend Golf Course, Ottawa ON
- · Conducted aquatic field assessments and reports for EA for vermiculite Canada project near



Bobcaygeon.

- Terrestrial screening level habitat assessment of Ferguson Lake development.
- Designed fish habitat compensation and monitoring plans for Cataraqui River Drilling Project.
- Assessed fish habitat within the Ottawa River near L'Orignal for the Wastewater treatment plant environmental screening report.
- Assessed fish habitat within Lake St. Lawrence (St. Lawrence River) near Morrisburgh for the wastewater treatment plant environmental screening report.
- Conducted level 1 terrestrial impact assessment for Vermiculite Canada project near Bobcaygeon.
- Conducted Environmental Screening Report for South Dundas between Morrisburg and Iroquois.
- Fish habitat assessment Foster Drain, Jock River, Ottawa ON
- Fish habitat assessment on drains on HWY 417 in Casselmen, ON
- Conducted fisheries habitat assessment and designed artificial embayments and fish habitat enhancements for the Chat Falls Boat By-pass.
- Conducted environmental assessment for the proposed South River Hydroelectric Facility including an assessment of impacts on aquatic and terrestrial habitats and communities.
- Wrote Environmental Screening Report and conducted environmental inspections for Cataraqui River Drilling Project.
- Conducted Alexandria Wastewater treatment Plant Expansion Environmental Impact Study.
- Conducted Westley's Point terrestrial and Aquatic Environmental Screening Report for a sewer and watermain.
- Fish habitat assessment on Poole Creek near Stittsville, ON.
- Conducted field work for the environmental screening for the Harbour Front Trunk Sewer Overflow Control – Environmental Assessment.
- Fish habitat assessment Sawmill Creek, Cahill Tributary and Brown's Inlet, Ottawa ON
- Conducted fish habitat assessment and prepared environmental impact statement investigating the potential impacts of a lowering and realignment on the aquatic habitat on Spratt Municipal Drain.
- Conducted terrestrial and aquatic field assessment and wrote Environmental Screening Report for a development project on Loughborough Lake.
- Identified and mitigated potential fish habitat impacts as a result of a proposed increase in water level of the Garry River System, Alexandria, Ontario.
- Fish habitat assessment of Hosaic Creek within the Dupont Nature Reserve, Morrisburg ON.
- Assisted with terrestrial environmental impact assessments, in identification of environmental features to identify constraints and opportunities in support of a proposed Official Plan amendment in Tatlock, Ontario.
- Conducted the marine aquatic impact assessment for the Strait of Georgia Pipeline Crossing, BC.
- Assisted with environmental impact assessments, environmental field reports and fieldwork for various pipeline projects in Alberta.
- Wrote Environmental Overview for Tanglewood Residential Development in Calgary.
- Wrote Environmental Overview for Creekside Mills Residential Development in Calgary.
- Wrote Environmental Overview and Environmental Protection Plan for Beddington Trail, Calgary.
- Wrote Environmental Overview for Elbow Valleye Environmental Protection Plan in Calgary.

Aquatic Inventories

• Completed fish community sampling for the Third Crossing on the Cataraqui River (boat electrofishing and seine netting).



- Completed fish community sampling on Lafontaine drain in Rockland for a proposed subdivision.
- Completed backpack electrofishing and minnow trapping on watercourses at proposed sand pit expansions in Greely, and Bourget Ontario.
- Completed backpack electrofishing and minnow trapping on tributaries to Brook Creek in Port Hope, on a tributary to the St. Lawrence River near Prescott and Wood Drain in South Glengarry for proposed solar farms.
- Completed walleye spawning monitoring (night surveys and egg traps) in and around the chute between Lakes Opemisca and Barlow in northern Quebec.
- Completed a fish kill monitoring of the recently upgraded water treatment facility in Southampton, ON.
- Completed fish community sampling on a tributary to Gray's Creek in Cornwall, Ontario for a proposed subdivision.
- Conducted young-of-the-year walleye monitoring on the Raisin River and Lake St. Francis using boat electrofishing, Cornwall ON.
- Conducted boat electrofishing sampling on the Cataraqui River for a proposed dredging program, Kingston ON.
- Completed boat electrofishing and habitat mapping for Port of Prescott proposed expansion.
- Conducted fish community sampling within an unnamed drain in Russell, ON.
- Conducted fish community sampling within Feedmill Creek for a proposed development Ottawa, ON.
- Conducted fish community sampling within a tributary to the St. Lawrence River, Brockville, ON.
- Conducted fish community sampling and pike monitoring on the Eastman Drain, Cornwall ON.
- Conducted fish community monitoring and pike surveys on the Heb Gordon Drain, Manotick, ON.
- Conducted fish community sampling on tributaries to Shirley's Creek Kanata, ON.
- Conducted fish community sampling on Foster Drain, Ottawa ON.
- Designed and conducted walleye larvae survey of Hoople Creek and Raisin River (neuston net).
- Collected and analyzed fish and benthic macroinvertebrates from Pattingale and Hoople Creeks for a comparison study of impacted and non-impacted sites for the Raisin Region Conservation Authority.
- Developed and conducted first year of sampling for a benthic macroinvertebrate monitoring program for PTTW, Riverbend Golf Course, near Ottawa, ON.
- Completed R.I.N. (OMNR) gill netting protocol on Reach 1 of the Bonnechere River, Renfrew ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Clarence Creek for a proposed subdivision, Rockland, ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Lafontaine Creek for a proposed subdivision, Rockland, ON.
- Collected fish community information from two tributaries to the Ottawa River, Wendover, ON.
- Sampled fish communities within Adams Pond (Ottawa, ON).
- Completed first year of fish community monitoring for the Poole Creek re-alignment at Huntmar Road, Ottawa (backpack electrofishing multi-season)
- Completed the first year of a three year monitoring project for the Cataraqui Utilities Crossing project within the Cataraqui River (boat shocking, seine netting, habitat assessment)
- Completed a three year monitoring project of the new wetland channel created in the Little Cataraqui River, Kingston ON (seine netting).



- Assessment of benthic macroinvertebrates and fish communities within tributaries of the Bonnechere River (Renfrew ON) (seine netting, gill netting, backpack electrofishing, minnow trapping, multi-season).
- Conducted fish removal on a tributary to Trout Lake for Cruickshank on HWY 60
- Conducted young-of-the-year muskie seining within the Ganonoque area for Muskies Canada and OMNR (seine netting)
- Fish community sampling Mosquito Creek, Carp River and its tributaries. Ottawa, ON (backpack shocking)
- Provided fish removal services for Poole Creek at Huntmar, Kanata Ontario.
- Conducted young-of-the-year muskie and walleye seining within Lake St. Francis (Cornwall, ON).
- Assisted the City of Ottawa in locating and identifying potential walleye spawning grounds in the Rideau River.
- Conducted boat electrofishing on the Cataraqui River (Kingston, ON).
- Collected and analyzed walleye eggs from the spawning grounds at on the Raisin River and Hoople Creek.
- Conducted shoreline boat and beach seining along Lake St. Francis for the Lake St. Francis Fish Habitat Plan.
- Conducted and analyzed data from a stream assessment project of Hoople, Hoasic and Sutherland Creeks (OSAP protocol).
- Conducted boat electrofishing along the shoreline of Lake St. Francis and Raisin River, Cornwall ON with the RRCA.
- Designed, collected and analyzed the results for benthic macroinvetebrate community surveys on several watercourses within Ontario including: South River (Village of South River), tributary to the Beaudette River (Alexandria), Hoasic and Hoople Creeks (Morrisburgh), Sutherland Creek and Raisin River (Cornwall), Jock River (Ottawa) and a tributary to Feedmill Creek (Ottawa).
- Collected information on aquatic habitat, including inventory of fish communities and spawning survey to support proposed water taking from the Tay River (backpack shocking).
- Conducted boat electrofishing along the shoreline of Raisin River, Cornwall ON.
- Lake St. Francis (Cornwall, ON) and on the Cataraqui River (Kingston, ON).
- Developed and conducted fish habitat and community study on the Lower Raisin River (backpack shocking, seine netting, boat eletrofishing multi-season).
- Developed, organized and conducted marine field work, gathered environmental information, located contacts and assisted in writing the draft report for the Strait of Georgia Pipeline Crossing.
- Developed and conducted a fish survey on West Nose Creek, Alberta.
- Assisted in a fry monitoring project at the NOVA pump house on Red Deer River, Alberta. Responsibilities included setting and monitoring fry traps, and data collection.
- Conducted FRBC stream inventorying for Lakeland Mills, British-Columbia.
- Project Director: Realized, developed and presented a population study on the host sea anemones and anemonefishes in Sulawesi, Indonesia in cooperation with McGill University, Ecosurveys Ltd (UK) and Newman Biomarine Pte Ltd (Singapore). The study involved coral habitat mapping and fish surveys.

Environmental and Fisheries Inspections

- Completed inspections during construction and fish salvage on Meade Creek at HWY 7, near Peterborough, ON.
- Designed fish salvage operations for a small hydro facility in Ontario.
- Clarkson's wastewater tunnel inspection design and quality control



- Burloak water purification tunnel blasting fish kill monitoring design and implementation
- Burloak water purification tunnel suspended sediments inspection design and implementation
- Provided environmental and fisheries inspections for the construction of the Poole Creek Realignment/Huntmar Drive Crossing.
- Conducted fish removal for MTO project on HWY 125.
- Provided fish removal services on the Trans-Northern Pipeline near Cornwall
- Provided fish removal services for a culvert replacement on Green's Creek near Maynooth, ON.
- Provide environmental and fisheries inspections for MTO projects in Napanee and Vankleek Hill, Lancaster and Ottawa Ontario.
- Conducted Environmental inspection of the dewatering process for the Elbow Valley Residential sanitary sewer system, Calgary Alberta.

Species at Risk Inventories

- Completed SAR assessment for the Colborne Effluent forcemain.
- Completed Protection of SAR assessment for MTO Contract 2010-4028 near Perth, ON.
- Completed butternut assessments in Port Hope, Prescott, and Martintown for proposed solar farms.
- Completed butternut assessments for a proposed sand pit expansion near Bourget, ON.
- Completed butternut assessment for proposed quarry near Moose Creek, ON.
- Completed SAR habitat assessment and search for butternut and American ginseng inventories along Thorps-Ellis Drain, S, D & G
- Completed SAR habitat assessment for proposed WPCP expansion in Greater Napanee, ON.
- Completed butternut assessment on butternuts located on a proposed property to be subdivided in Stittsville.
- Completed butternut inventory for the proposed Clear Point Hydroelectric facility, Renfrew, ON.
- Completed visual surveys for turtle species at risk along the Bonnechere River, Renfrew, ON.
- Completed visual survey for Eastern musk turtle near Kemptville, ON

Other

- Currently co-authoring the Walleye Management Plan for Lake St. Francis with the Raisin Region Conservation Authority and OMNR.
- Assisted in the peer review of the Talston Hydroelectric project, NWT Canada.
- Presented a talk on monitoring walleye larvae and BMPs at the IAGLR Conference, May 2006.
- Presented *How to Develop a Monitoring Program for BMPs* at the Great Lakes Sustainability Non Point Source Symposium, March 2006
- Co-authored Lake St. Francis Fish Habitat Plan for Raisin Region Conservation Authority.
- Coordinated the 2003 Strategic Habitat Restoration Working Group workshop for the Raisin Region Conservation Authority.
- Co-authored a paper on the Effects of Marine Pipelines on the Benthic Environment, presented at the 7th International Symposium on Environmental Concerns in Right-of-Way Management.
- Created and conducted environmental education programs in French for children and the general public.



SHAUN M. ST.PIERRE, B.Sc.

EDUCATION

B.Sc. Biology, Trent University 2007

Fisheries and Wildlife Technology, Frost Campus, Sir Sandford Fleming College, 2005 Fisheries and Wildlife Technician, Frost Campus, Sir Sandford Fleming College, 2004

LANGUAGES

Fluent in French and English

POSITIONS HELD

2006-:	Bowfin Environmental Consulting Inc., Field Assistant/Environmental Site
Inspector	
2005:	St. Lawrence River Institute of Environmental Sciences, Field Research Assistant
2004:	MNR Kawartha Lakes, Field Research Assistant
2003:	DFO- Experimental Lake Area, Field Research Assistant
2001:	Resource Stewardship S, D &G, Stewardship Ranger

CERTIFICATIONS

Ontario Benthos Biomonitoring Network, Ontario Stream Assessment Protocol, Butternut Health Assessor, Class 2 Electroshocking, first aid, CPR, Pleasure Craft Operator Card, Marine Radio Operator, WHMIS, All Terrain Vehicle Riders Course (issued by the Manitoba Safety Council), Water Safety Training (Bronze Cross), Ontario Trapping Course and Snowmobile Licenses.

EXPERIENCE

Experience assisting in environmental monitoring, environmental assessments, terrestrial habitat assessment, freshwater habitat assessment, fish behavioral studies, winter bat hibernaculum inventories and fisheries inventories including habitat mapping, electroshocking, FWIN and RIN. Other experience include GIS.

Aquatic Inventories

- Assisted with boat electrofishing along the shoreline of the Cataraqui River (Kingston, ON), South Nation River (Casselman, ON), Raisin River (Lancaster, ON), and Lake St.Francis (South Lancaster, ON).
- Assisted in collecting and data entry for benthic macroinvetebrate community surveys on several watercourses within Ontario including: Bonnechere River (Renfrew, ON), tributaries of the Bonnechere River (Renfrew, ON), the Jock River (Ottawa, ON) and tributary to the Beaudette River (Alexandria, ON).
- Assisted in collecting and data entry for several fish community surveys using backpack electrofisher including: Bonnechere River (Renfrew and Douglas, ON), tributaries of the Bonnechere River (Renfrew, ON), tributary to the Beaudette River (Alexandria, ON),



tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON) and Lac Opemisca (Ouje-Bougoumou, QC).

- Mapped fish habitat in many watercourses including: tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON).
- Assisted in YOY sampling on the Raisin River (Lancaster, ON).
- Assisted in conducting riverine index netting on the Bonnechere River (Renfrew, ON).
- Assisted in conducting larvae surveys on Hoople Creek, Raisin River and the Bonnechere River.
- Assisted in collecting walleye eggs from the spawning grounds on the Raisin River and Hoople Creek.
- Assisted in the monitoring of a new wetland channel created in the Little Cataraqui River.
- Marsh monitoring program breeding amphibian survey at Hoople Creek and the Bonnechere River.
- Assisted in conducting fall walleye index netting for the MNR in Kawartha Lakes

Species at Risk Inventories

- Butternut survey and assessment for proposed development (Brockville, ON).
- Butternut survey and assessment for proposed development (South Lancaster, ON).
- Butternut survey and assessment for quarry expansion (Moosecreek, ON).
- Butternut survey and assessment for quarry expansion (Westminster, ON).
- Butternut survey along the Bonnechere River near Renfrew Ontario.
- American Eel survey on the South Nation River (Casselman, ON)
- American Ginseng survey for proposed development (South Lancaster, ON).
- American Ginseng survey along the Bonnechere River near Renfrew Ontario.

Terrestrial Inventories

- Plant community inventories for proposed development (Ouje-Bougoumou, QC)
- Plant community inventories for proposed development (Brockville, ON)
- Plant community inventories for proposed development (Hamilton, ON)
- Plant community inventories for proposed development (Simcoe, ON)
- Plant community inventories for proposed development (South Lancaster, ON).
- Plant community inventories for quarry expansion (Moosecreek, ON).
- Plant community inventories for quarry expansion (Westminster, ON).
- Plant community inventories along the Bonnechere River (Renfrew)
- Plant community inventories for the Caron street extension (Rockland)

Environmental and Fisheries Inspections

- Conducted environmental inspections for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Assisted in providing environmental and fisheries inspections for the blasting and drilling operation for the Burloak Water Purification Tunnel project (Burlington, ON).
- Assisted in providing environmental and fisheries inspections for the construction of the Poole Creek Re-alignment/Huntmar Drive Crossing.

Aquatic Habitat Mapping for Municipal, City Roads and Provincial Highways



• Conducted MTO habitat assessments at Prince of Wales, Fernbank road, Fallowfield road, HWY 115, Arbuckle drain, the Carp river, tributaries to the Carp river and tributaries to Mud creek.

Other

- Assisted in conducting a winter bat hibernaculum inventory (Plantagenet)
- Field research assistant for the Metalicuus study and EDC study (Experimental Lakes Area)
- Captured, pit tagged and tracked Northern Pike (Experimental Lakes Area)
- Construction and maintenance of nature trail (the Cornwall Outdoor Recreational Area)
- Conducted frog deformities surveys (Glengarry)



Appendix C – Field Notes





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Appendix D – Site Concept Plans

