



Pukaskwa
National Park

Marathon Palladium Project

Parks Canada Agency Submission to the Joint Review Panel

February 21, 2022



Pukaskwa
National Park

Prepared by:

Daniel Pouliot, Resource Conservation Manager, Pukaskwa National Park

Lucy Patterson, Ecologist Team Leader, Pukaskwa National Park

Joanne Tuckwell, Species Conservation Specialist, Conservation Programs Branch

Heather Cherry, Impact Assessment Scientist, Natural Resource Management Branch

Eri Hiraga, Impact Assessment Scientist, Natural Resource Management Branch

Recommended by:

Christine Drake, Park Superintendent

Pukaskwa National Park

Approved on behalf of Parks Canada Agency:

<Original signed by>

February 21, 2022

Sharon Hayes
Field Unit Superintendent
Northern Ontario Field Unit
Parks Canada Agency

Date



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Executive Summary

Parks Canada participated in the review of the Marathon Palladium Project, a proposed mining project approximately 20 km northeast of Pukaskwa National Park. Parks Canada provided information and expertise related to potential impacts on boreal caribou within the Coastal Range (ON6) that encompasses Pukaskwa National Park. Pukaskwa National Park is likely not large enough to maintain boreal caribou without sufficient habitat and connectivity within the Coastal Range and to the north, beyond the boundaries of the park. As a result, Parks Canada's participation focused on the importance of maintaining adequate functioning habitat and connectivity outside of the park to support boreal caribou conservation and recovery within Pukaskwa National Park. Throughout the assessment, Parks Canada participated on the Government Review Team with federal and provincial departments in the review and assessment of relevant information related to potential impacts on boreal caribou. In particular, Parks Canada collaborated closely with Environment and Climate Change Canada (ECCC) as the lead federal department for species at risk on lands outside of those administered by Parks Canada and supports the conclusions and recommendations related to boreal caribou presented by ECCC.



Abbreviations

CEAA	Canadian Environmental Assessment Act
CEAR	Canadian Environmental Assessment Registry
CIAR	Canadian Impact Assessment Registry
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
MECP	Ministry of the Environment, Conservation and Parks
NRCan	Natural Resources Canada



Introduction

This submission is in response to the request from the Joint Review Panel (the Panel) for Parks Canada to participate in the public hearing process for the Marathon Palladium Project (the Project). The Panel requested that Parks Canada provide a technical written submission on the potential environmental effects of the Project, including recommendations, as they relate to Parks Canada's expertise. In particular, the Panel requested the following topics be discussed:

- potential impacts on boreal caribou within the Coastal Range (ON6) that encompasses Pukaskwa National Park; and,
- other species under the *Species at Risk Act* within the national park.

Parks Canada has provided expertise on matters related to Parks Canada's mandate that may be impacted by the Project (Table 1). Accordingly, participation is focused on potential impacts on boreal caribou within the Coastal Range (ON6) that encompasses Pukaskwa National Park. Parks Canada does not have additional information or expertise to share related to potential impacts of the Project on other species at risk within Pukaskwa National Park.

Table 1. Summary of Parks Canada's written responses during the Pre-Hearing stage of the Marathon Palladium Project Review.

March 17, 2010: Parks Canada response to CEAA confirming that Parks Canada will provide advice pursuant to section 12(3) of the Canadian Environmental Assessment Act (1992) as an Expert Federal Authority. Document not listed on the Canadian Environmental Assessment registry (CEAR).

October 25, 2012: Parks Canada comments to CEAA regarding "Participation of Parks Canada in the Public Review and Comment Period on the Adequacy of the Environmental Impact Statement". CEAR Doc #299.

July 29, 2013: Parks Canada letter to Panel Chair "Information Request by Stillwater with respect to concerns around Woodland caribou – Marathon PGM-Cu Mine Project". CEAR Doc # 541.

July 21, 2021: Parks Canada letter to the Joint Review Panel regarding the sufficiency of information in the 2021 EIS addendum to proceed to public hearing. CIAR #883.

Parks Canada Mandate, Roles and Responsibilities

Parks Canada fulfils its mandate through the management and administration of Canada's national heritage protected areas networks, which preserve and present the rich diversity of Canada's natural and cultural heritage to the benefit of Canadians and visitors from around the world. Pursuant to Section 20 of the *Canadian Environmental Assessment Act, 2012*, Parks Canada participates as a federal authority when in possession of relevant specialist information or expertise related to potential impacts of a project on protected heritage areas or resources administered by Parks Canada.



Parks Canada also has a legislated role with respect to the protection and recovery of species at risk, including woodland caribou, boreal population (*Rangifer tarandus caribou*; referred to as ‘boreal caribou’) on lands administered by Parks Canada. Outside of lands administered by Parks Canada, Environment and Climate Change Canada (ECCC) is responsible for implementing the *Species at Risk Act*. In addition, the Ontario Ministry of the Environment, Conservation and Parks (MECP) has the primary responsibility for boreal caribou management on lands under provincial jurisdiction. To that end, Parks Canada has been collaborating with provincial (MECP) and federal (ECCC and Natural Resources Canada, NRCan) departments in the review of this Project.

Project Review

Parks Canada’s participation in the proposed Marathon Palladium Project focuses on potential impacts on boreal caribou within the Coastal Range (ON6) that encompasses Pukaskwa National Park (Figure 1). During the review of the Project, Parks Canada reviewed all material supplied by the Proponent related to boreal caribou, including, but not limited to the EIS and supporting documents (CIAR #224, CIAR #227) the EIS addendum (CIAR #727), responses to Information Requests (CIAR #757, CIAR #912, and CIAR #950), and the responses to information that the Panel requested in the Notice of Sufficiency (CIAR #976).

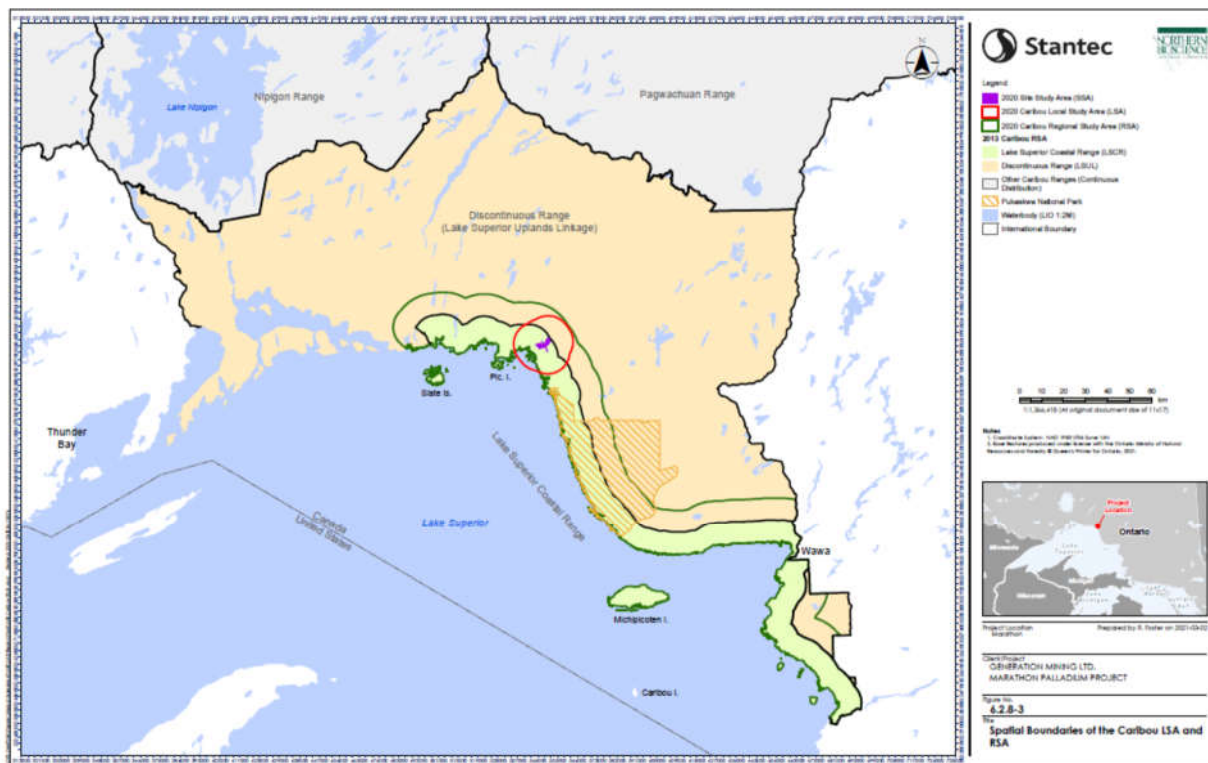


Figure 1: Lake Superior Coastal Range, Pukaskwa National Park and proposed Project site (Source: EIS addendum 2021, CIAR #727, Figure 6.2.8-3).



Up until the last decade, boreal caribou were regularly occurring within the boundaries of Pukaskwa National Park. Aerial surveys demonstrated a decline in the numbers of individuals from 1974 to 2009 (Patterson *et al.* 2014). Since 2010, the park has monitored boreal caribou through a network of trail cameras in critical habitat, including calving habitat, along the coast and on off-shore islands (N=10-27 cameras, depending on the year). The last likely resident animal was observed in 2011, although a lone animal was also observed in the north end of the park in 2015 (Drake *et al.* 2018). Despite low numbers observed within the park and the range, Pukaskwa National Park continues to protect critical habitat for boreal caribou, monitor former calving habitat using wildlife cameras, and educate visitors and Canadians on boreal caribou conservation.

Maintaining adequate functional habitat and connectivity within and between ranges is critical for the persistence of boreal caribou on the landscape (ECCC 2020). As summarized in the recovery strategy (ECCC 2020), habitat connectivity facilitates predator avoidance, seasonal movements among habitats, use of different areas in response to disturbance and changing environmental conditions (e.g., climate change), and migration between populations, which increases gene flow and thereby increases genetic diversity and resilience to environmental stressors.

Connectivity within the Coastal Range and between ranges is also expected to impact the success of future recovery measures at Pukaskwa National Park. Pukaskwa National Park has collaborated with partners to assess the feasibility and expected probability of success of translocating boreal caribou into the park in the future. However, boreal caribou home ranges consistently exceed 1,400 km² where there is little disturbance (Wilson *et al.* 2019). At an area of 1,878 km², Pukaskwa National Park is likely too small of a protected area to support resident boreal caribou in the long term without adequate habitat and connectivity within the range. Gonzales *et al.* (2015) found that translocation efforts into Pukaskwa National Park were unlikely to succeed under current conditions and argued that the long-term recovery and survival of caribou would likely be hampered by habitat conditions outside of park boundaries, as well as a lack of connectivity with more northern populations.

Ultimately, the recovery of boreal caribou in Pukaskwa will depend on larger scale landscape planning and restoration initiatives, to ensure habitat beyond the park boundaries will facilitate a self-sustaining boreal caribou population within the Coastal Range. As a result, Parks Canada has been working closely with ECCC in the review of potential impacts of this Project on boreal caribou habitat and connectivity, and supports the conclusions and recommendations presented by ECCC.

Summary of Recommendations

As highlighted above, impacts to boreal caribou habitat and connectivity beyond the borders of Pukaskwa National Park have implications for the conservation and recovery of boreal caribou within the park. Although not the lead federal department under the *Species at Risk Act* for boreal caribou on lands in the Coastal Range outside Pukaskwa



National Park, Parks Canada continues to collaborate with federal and provincial experts that have responsibilities related to boreal caribou in the Coastal Range (ON6). Parks Canada worked closely with ECCC throughout the technical review of boreal caribou information related to this Project, including analysis of the significance of effects, evaluation of mitigation measures, appropriateness of proposed monitoring and follow-up programs, and development of recommendations. The content of ECCC's hearing submissions to the Panel relating to boreal caribou within the Coastal Range (ON6) are directly relevant to conservation and recovery goals for boreal caribou within Pukaskwa National Park. As a result, Parks Canada supports ECCC's conclusions and recommendations for this Project as they relate to boreal caribou and has no further recommendations to provide.

References

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- Drake, C.C., Manseau, M., Klutsch, C.F.C., Priadka, P., Wilson, P.J., Kingston, S. and Carr, N. 2018. Does connectivity exist for remnant boreal caribou (*Rangifer tarandus caribou*) along the Lake Superior Coastal Range? Options for landscape restoration. *Rangifer*, 38(1):13-26 (online).
- Gonzales, E.K., Nantel, P., Rodgers, A.R., Allen, M.L., and Drake, C.C. 2015. Decision-support model to explore the feasibility of using translocation to restore a woodland caribou population in Pukaskwa National Park, Canada. *Rangifer*, 35(23): 27-48.
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- Wilson, K.S., Pond, B.A., Brown, G.S., and Schaefer, J.A. 2019. The biogeography of home range size of woodland caribou *Rangifer tarandus caribou*. *Diversity and Distributions* 25: 205–216.

Christine Drake, MSc.F.
Park Manager, Pukaskwa National Park
Parks Canada Agency
Hwy 627
Heron Bay, Ontario, P0T 1R0

Curriculum Vitae

SUMMARY

Ms. Christine Drake is the Park Manager, Pukaskwa National Park with Parks Canada Agency. As Park Manager, Ms. Drake is responsible for overseeing visitor experience, as well as natural and cultural resource management of Pukaskwa National Park. Ms. Drake's related relevant experience includes previous positions with Pukaskwa National Park as the Resource Conservation Manager and Park Ecologist.

EXPERIENCE

May 2018 – present, **Park Manager, Pukaskwa National Park, Parks Canada Agency**

Responsible for overall park operations. This includes protecting and presenting natural and cultural resources, maintaining infrastructure, as well as engaging partners and stakeholders.

2008-2009; 2011-2015, **Resource Conservation Manager, Pukaskwa National Park, Parks Canada Agency**

Responsible for overseeing natural and cultural resource management programs in Pukaskwa National Park. This included environmental impact assessments, species at risk, ecosystem research and monitoring.

2017-2018, **Ecological Restoration Specialist, Pukaskwa National Park, Parks Canada Agency**

Assisted in coordinating and implementing a national funding program for conservation and restoration projects across Parks Canada.

2007-2008; 2009-2010; 2015-2017, **Park Ecologist/ Monitoring Ecologist, Pukaskwa National Park, Parks Canada Agency**

Responsible for monitoring and restoration projects to ensure maintenance or improvement of ecological integrity in the park. This included species at risk research and monitoring, restoration and ecological integrity monitoring in Pukaskwa National Park. I was involved or coordinated several research and monitoring projects on boreal caribou, which culminated in the publications listed below.

2005-2007, **Species at Risk Biologist, Canadian Wildlife Service, Environment Canada**

Responsible for recovery planning for several Species at Risk in Ontario, through development of individual species recovery strategies. Also provided reviews of Impact Assessments on major projects.

EDUCATION

Master of Science in Forestry (M.Sc.F), University of Toronto, Toronto, ON, 2003

Bachelor of Science (B.Sc.); double major in Biology & Environmental Science (Honours)
Trent University, Peterborough, ON, 1999

PUBLICATIONS

Journals

Drake, C., M. Manseau, K. Clutch, P. Pradika, S. Kingston, N. Carr, and P. Wilson. 2018. Does connectivity exist for remnant boreal caribou (*Rangifer tarandus caribou*) along the Lake Superior Coastal Range? Options for landscape restoration. *Rangifer* 38 (1): 13-26
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Patterson, L.P., **C. Drake**, M. Allen and L. Parent. 2014. Detecting a population decline of woodland caribou (*Rangifer tarandus caribou*) from non-standardized monitoring data in Pukaskwa National Park, Ontario. *Wildlife Society Bulletin*. <https://doi.org/10.1002/wsb.402>

Technical reports

Parks Canada Agency (Zorn, P., **C. Vance**, G. Stroud and J. Haselmayer). Pukaskwa National Park 2008 State of the Park Report. Parks Canada, Heron Bay, Ontario.

Vance, C., M. Carlson, P. Zorn and L. Parent. 2008. Technical Compendium supporting the 2008 Pukaskwa National Park State of the Park Report. Parks Canada.

Daniel Pouliot, M.Sc.
Resources Conservation Manager, Pukaskwa National Park
Parks Canada Agency
0 Highway 627
Heron Bay, ON P0T1R0

Curriculum Vitae

SUMMARY

Mr. Daniel Pouliot is the Resources Conservation Manager at Pukaskwa National Park with the Parks Canada Agency. Daniel is managing the resources conservation section. The section is responsible for the conservation of cultural and natural resources, including the study and recovery effort of the species at risk present in the park.

EXPERIENCE

- 2016 – present, **Resources Conservation Manager, Pukaskwa National Park**
Manage the section. Responsible for the conservation of the natural and cultural resources in the park. Study, monitor and restore ecosystem integrity and species at risk, and manage incidents involving wildlife, fire and visitor safety.
- 2003-2015, **Various positions with Resources Conservation, La Mauricie National Park and Kejimikujik National Park and National Historic Site.**
Project manager for the restoration of aquatic ecosystem connectivity, lead the science, monitoring, and impact assessment team; complete the field work.
- 2014-2015, **Habitat Stewardship Program Officer, Canadian Wildlife Service**
Part of the team to manage the HSP: support proponent in the development of their proposal, assess proposals, manage funding agreement.
- 2013-2014, **Coordinator for species at risk recovery teams, Quebec Ministry of Natural Resources**
Lead and coordinate the work of two recovery teams: American Eel and Copper Redhorse; Develop and implement studies, monitoring programs, and recovery actions for a number of species at Risk.
- 1999-2007, **Freelance biologist**
Various contracts on natural resources inventory and conservation

EDUCATION

Master of Science in Environmental Sciences, Université du Québec a Trois-Rivières, 2007

Bachelor of Science in Biology-Ecology, Université du Québec a Trois-Rivières, 2004

Technique d'inventaire et de recherche en biologie, CEGEP de Sainte-Foy, 2001

PUBLICATIONS

Journals

Pouliot, D., and J.-J. Frenette. 2010. Development and Growth of Northern Leopard Frog, *Lithobates pipiens*, Tadpoles in North American Waterfowl Management Plan Permanent Basins and in Natural Wetlands. Canadian Field-Naturalist 124 (2): 159-168.

Pouliot, D., J. Bergeron, et N. Côté. 2009. Origine, répartition et habitats de la grenouille verte aux îles de la Madeleine, Québec. Le Naturaliste Canadien. Vol.133, no. 2. 37-44.

Pouliot, D., and H. Bastien. 2009. *Hemidactylium scutatum* (Four-toed salamander) distance from nesting sites. Herpetological review. 40 (2).

Desroches, J.-F., **D. Pouliot**, I. Picard, et R. Lapare. 2008. Nouvelles mentions pour six espèces de poissons d'eau douce rares au Québec. Le Naturaliste Canadien. Vol. 132, no. 2. 62-66.

Pouliot, D., et J.-M. Vallières. 2007. Quelques mentions herpétologiques d'intérêt pour la Mauricie. Naturaliste Canadien. Vol. 131, no.2. 44-50.

Pouliot, D., J.-J. Desroches, et D. Banville. 2007. Inventaire herpétologique de la région de la Capitale-Nationale en 2002. Naturaliste Canadien. Vol. 131, no.1. 34-40.

Pouliot, D. and N. Côté. 2007. *Aspidoscelis tigris tigris* diet. Herpetological Review. 38 (4) : 450.

Desroches, J.-F., et **D. Pouliot**. 2005. Premières mentions et répartition de la Salamandre sombre du Nord, *Desmognathus fuscus*, sur la rive nord du fleuve Saint-Laurent, au Québec. Canadian Field-Naturalist 119(1): 105-109.

Desroches, J.-F., et **D. Pouliot**. 2005. La recherche des nids : une méthode simple et efficace pour trouver la salamandre à quatre orteils (*Hemidactylium scutatum*), une espèce rare au Québec. Le Naturaliste Canadien. Vol.129, No.2. p.30-33.

Desroches, J.-F., and **D. Pouliot**. 2005. *Hemidactylium scutatum* (Four-toed salamander) nests. Herpetological review. 36 (1). p.51-52.

Pouliot, D., et J.-F. Desroches. 2005. Découverte de la Salamandre à quatre orteils, *Hemidactylium scutatum*, à Québec, Québec : limite nord-est de l'espèce sur la rive nord du fleuve Saint-Laurent. Canadian Field-Naturalist 119(1) :129-131.

Technical reports

Pouliot, D. 2015. George Island Garter Snake Population Monitoring 2015 Survey. Kejimikujik National Park and National Historic Site. Parks Canada Agency. 22 pages.

Pouliot, D. 2008. Observations of fauna during a canoe trip in the Tobeatic Wilderness Area, Southwest Nova Scotia, May 3rd to 7th 2008. Kejimikujik National Park and National Historic Site. Parks Canada Agency. 28 pages.

Bastien, H., et **D. Pouliot**. 2008. Campagne d'échantillonnage de la salamandre a quatre orteils (*Hemidactylium scutatum*) dans le bois Neilson, ville de Québec. Ministère des Ressources naturelles et de la Faune du Québec, Direction régionale de l'aménagement de la faune de la Capitale-Nationale et de Chaudière-Appalaches. 26 pages.

Pouliot, D. 2008. Rapport sur la situation de la couleuvre brune (*Storeria dekayi*) au Québec. Ministère des Ressources Naturelles et de la Faune du Québec. 27 pages.

Pouliot, D. 2003. Inventaire des reptiles et des amphibiens du Lieu historique national du Canada des Forges-du-Saint-Maurice. Préparé pour Parcs Canada, dans le cadre de l'application de la loi sur les espèces en péril. 31 pages et 8 annexes.

Pouliot, D., J.-F. Desroches, et D. Banville. 2003. Inventaire des amphibiens et des reptiles de la région de la Capitale-Nationale en 2002. Société Linéenne du Québec. 39 pages.

Desroches, J.-F., **D. Pouliot** et S. Côté. 2002. Efficacité de différentes méthodes de capture pour la rainette faux-grillon de l'ouest (*Pseudacris triseriata*) au Québec. Pour la Société de la Faune et des Parcs du Québec. 50 pages et 3 annexes.

Books

Green, D.M. (ed.). 2012. Noms français standardisés des amphibiens et des reptiles d'Amérique du Nord, au nord du Mexique. Standard french names of amphibians and reptiles of North America, north of Mexico. SSAR, Salt Lake City.

Paper presented at a meeting (not published)

Scientific conferences

Annual meeting of the Society for Conservation Biology San Jose, California. 2006:

Pouliot*, D et J.-J. Frenette. Environment, development and growth of northern leopard frog (*Rana pipiens*): implications for NAWMP wetlands management

Canadian amphibians and reptiles conservation network

Orford 2013:

Pouliot, D., D. Masse, and Y. Robitaille. Raccoon predation induced a short-term decline in a nesting population of Wood turtle (*Glyptemys insculpta*)

Pouliot, D., D. Masse, Y. Robitaille, and C. Samson. Are juveniles Wood turtles (*Glyptemys insculpta*) "home bodies"?

Wolfville 2010 :

Pouliot*, D., D. Masse, C. Samson, S. Paradis et Y. Robitaille. Juvenile wood turtle translocation: a pilot project a La Mauricie National Park

Kingston, Ontario. 2007:

Pouliot, D. and J.-J. Frenette. North American Waterfowl Management Plan wetlands as useful tools for the conservation of the Northern Leopard Frog

Ottawa, Ontario. 2005:

Pouliot, D. and J.-F. Desroches. Looking for nests to find the rare four-toed salamander (*Hemidactylum scutatum*): technical approach and nest characterization

Pouliot, D. and H. Bastien. How far from the nesting site should we protect the four-toed salamander (*Hemidactylum scutatum*)? A case of urban conservation

Pelee Island, Ontario 2003:

Pouliot, D. and J.-F. Desroches. Range extension and habitat description for the northern dusky salamander (*Desmognathus fuscus fuscus*) on the Saint-Lawrence river north shore

Canadian Wildlife Service Annual Seminars

Pouliot, D. Mars 2009. Historique des observations de la Salamandre à quatre orteils au Bois  Neilson.

Pouliot, D. and J.-J. Frenette. October 2006. Physical and chemical characteristics of wetlands in the floodplain of Lake Saint Pierre: relation to the development and growth of Northern leopard frog (*Rana pipiens*) tadpoles

Lucy Patterson, Ph.D.
Ecologist Team Leader I, Pukaskwa National Park
Parks Canada Agency
0 Highway 627
Heron Bay, Ontario, P0T 1R0

Curriculum Vitae

SUMMARY

Dr. Lucy Patterson is an Ecologist Team Leader at Pukaskwa National Park, with Parks Canada Agency. She is responsible for the development and implementation of the ecological integrity monitoring program and for the management of species at risk in the park, including Woodland Caribou, boreal population (*Rangifer tarandus caribou*).

EXPERIENCE

2019 – present, **Ecologist Team Leader, Pukaskwa National Park, Parks Canada**

Responsible for the development and implementation of the ecological integrity monitoring program and the management of species at risk within the park, including Boreal Caribou (*Rangifer tarandus caribou*); and for leading a team in the collection, analysis and reporting of ecological data

2018/11-2019/01, **Ecological Monitoring Specialist, Office of the Chief Ecosystem Scientist, Protected Areas Establishment and Conservation, Parks Canada**

Wrote guidelines for Wood Buffalo National Park on inferring causation from ecological monitoring data

2018/01-2018/09, **Ecological Monitoring Specialist, Monitoring and Ecological Information, Protected Areas Establishment and Conservation, Parks Canada**

Provided guidance to park ecologists on the design and analysis of measures in their ecological integrity monitoring program; wrote and reviewed sections of national standards for ecological integrity monitoring

2013-2017, **Teaching Assistant, Department of Biology, University of Ottawa**

Lead discussion groups, wrote and delivered lectures, explained laboratory and field data collection techniques, and marked assignments for several undergraduate courses in general ecology, zoology, animal behaviour, and limnology

2012-2013, **Ecologist Team Leader, Wood Buffalo National Park, Parks Canada**

Responsible for the management of wildlife and the Peace-Athabasca Delta region of the park, including species at risk such as Whooping Cranes and Wood Bison. Member of the Peace-Athabasca Delta Ecological Monitoring Program (PADEMP) partnership

2011, **Monitoring Ecologist, Pukaskwa National Park, Parks Canada**

Produced a scientific article on the population trend of Boreal Caribou within the park; reviewed the Recovery Strategy
Responsible for the development and implementation of the ecological integrity monitoring program, and for leading a team in the collection, analysis and reporting of ecological data

2010-2011, **Resource Conservation Technician, St. Lawrence Islands National Park, Parks Canada**

Collected and analysed monitoring data, and wrote the technical compendium for ecological measures in the State of the Park Report; analysed data and reviewed the Recovery Strategy for Gray Ratsnakes

2009-2010, **Ecosystem Scientist Intern, St. Lawrence Islands National Park, Parks Canada**

Assisted with the data collection, data analysis, management actions, and reporting for hyperabundant white-tailed deer management

EDUCATION

Doctor of Philosophy (Ph.D.) in Biology, University of Ottawa, Ottawa, Ontario, 2018

Master of Science (M.Sc.) in Biology, Laurentian University, Sudbury, Ontario, 2009

Bachelor of Science (B.Sc., Honours) in Biology, University of Ottawa, Ottawa, Ontario, 2007

PUBLICATIONS

Journals

Irvine, C.C., and **Patterson, L.D.** In press. Status and declining trend of Sparrow's-egg Lady's-slipper (*Cypripedium passerinum*) orchids in Pukaskwa National Park, Ontario, Canada. *Canadian Field-Naturalist*. **135**(4), 000–000.

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Sopinka, N.M., **Patterson, L.D.**, Redfern, J.C., Pleizier, N., Belanger, C., Midwood, J.D., Crossin, G.T., and Cooke, S.J. 2015. Manipulating glucocorticoids in wild animals: basic and applied perspectives. *Cons. Physiol.* **3**(1), cov031.

Halliday, W.D., Paterson, J.E., **Patterson, L.D.**, Cooke, S.J., and Blouin-Demers, G. 2014. Testosterone, body size, and sexual signals predict parasite load in Yarrow's spiny lizards (*Sceloporus jarrovi*). *Can. J. Zool.* **92**, 1075-1082. (joint first-author)

Patterson, L.D., Drake, C.C., Allen, M.L., and Parent, L. 2014. Detecting a population decline of woodland caribou (*Rangifer tarandus caribou*) from non-standardized monitoring data in Pukaskwa National Park, Ontario. *Wild. Soc. Bull.* **38**, 348-357.

Hebert, C.E., Campbell, D., Kindopp, R., MacMillan, S., Martin, P., Neugebauer, E., **Patterson, L.**, and Shatford, J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Env. Sci. Tech.* **47**, 11785–11792.

Patterson, L.D., and Schulte-Hostedde, A. 2011. Behavioural correlates of parasitism and reproductive success in male eastern chipmunks, *Tamias striatus*. *Anim. Behav.* **81**(6), 1129-1137

Patterson, L.D., and Blouin-Demers G. 2008. The effect of constant and fluctuating incubation temperatures on the phenotype of black ratsnakes (*Elaphe obsoleta*). *Can. J. Zool.* **86**, 882-889.

Technical reports (select recent)

Nabigon, A. and **Patterson, L.** 2021. 2021 Technical report of the peregrine falcon measure, coastal ecosystem, for Pukaskwa National Park. Heron Bay, ON. 16 pp.

Parsons, S., and **Patterson, L.** 2021. 2020 Technical report of bat acoustic inventory and monitoring, species at risk, Pukaskwa National Park. Heron Bay, ON. 15 pp.

Gilhooly, P., and **Patterson, L.** 2020. 2019 Technical report of the grey wolf measure, forest ecosystem, for Pukaskwa National Park. Heron Bay, ON. 11 pp.

Irvine, C., Lefort, L., and **Patterson, L.** 2020. Pitcher's Thistle (*Cirsium pitcheri*) recovery in Pukaskwa National Park: 2020 technical report. Heron Bay, Ontario. 32 pp.

Patterson, L., and Chartrand, C. 2020. 2018 Assessment of stream water quality for freshwater ecosystems in Pukaskwa National Park. Heron Bay, ON. 9 pp.

Paper presented at a meeting (not published)

Patterson, L.D. and Blouin-Demers, G. 2017. Nourriture ou température? Les déterminants de la taille du domaine vital et de la densité chez les lézards *Sceloporus jarrovi*. Oral presentation at the national conference of the Société québécoise pour l'étude biologique du comportement.

Patterson, L.D. and Blouin-Demers, G. 2017. To eat or thermoregulate? Determinants of habitat selection in *Sceloporus jarrovi*. Oral presentation at the national conference of the Canadian Society for Ecology and Evolution.

Patterson, L.D., Darveau, C.-A., and Blouin-Demers, G. 2016. La préférence thermique et le taux de croissance chez les lézards épineux de Yarrow (*Sceloporus jarrovi*) : Un test de l'hypothèse de la coadaptation thermique. Oral presentation at the national conference of the Société québécoise pour l'étude biologique du comportement.

Patterson, L.D. and Schulte-Hostedde, A.I. 2009. Personality and male reproductive success in eastern chipmunks (*Tamias striatus*). Oral presentation at the national conference of the Canadian Society for Ecology and Evolution.

Lucy Patterson, Ph.D.
Ecologist Team Leader I, Pukaskwa National Park
Parks Canada Agency

Curriculum Vitae

Patterson, L.D. and Schulte-Hostedde, A.I. 2009. Personality and male reproductive success in eastern chipmunks (*Tamias striatus*). Oral presentation at the national conference of the Société québécoise pour l'étude biologique du comportement.

Patterson, L.D. and Schulte-Hostedde, A.I. 2009. Le tempérament et le succès reproducteur chez les tamias rayés (*Tamias striatus*) mâles. Oral presentation at the regional conference of L'association francophone pour le savoir.

Joanne Tuckwell, MSc.
Species Conservation Specialist, Conservation Programs Branch
Parks Canada Agency
145 McDermot Ave
Winnipeg, Manitoba R3N 0X6

Curriculum Vitae

SUMMARY

Ms. Joanne Tuckwell is the Species Conservation Specialist, Species Conservation, Conservation Programs Branch, Protected Areas Establishment and Conservation Directorate, with Parks Canada. She supports the implementation of the Species at Risk Act, including the interpretation of the Act and how it applies in Parks Canada places, the writing and review of recovery documents, and the impact assessment and permitting of activities likely to affect species at risk.

EXPERIENCE

2003 – current **Species Conservation Specialist, Conservation Programs Branch, Protected Areas Establishment and Conservation, Parks Canada Agency**

- Coordinate the implementation of the Species at Risk program in the prairie and northern National Parks of Canada.
- Assist with review and drafting of species at risk recovery documents
- Review and draft policy relating to the implementation of the Species at Risk Act
- Review and provide advice on impact assessments and permitting requirements

2000 – 2003 **Ecosystem Services Technician, Parks Canada**

Supported Parks Canada places with GIS needs; and, monitored vegetation changes within the northwest National Parks using AVHRR Geocomp imagery in PCI and ENVI software.

EDUCATION

Advanced Diploma, GIS, Red River College, Winnipeg, Manitoba, 2000

Master of Science in Biology, Trent University, Peterborough, Ontario, 1996

Master of Science in Zoology, University Manitoba, Winnipeg, Manitoba, 1993

PUBLICATIONS

Journals

Tuckwell, J. and E. Nol. 1997. Foraging behaviour of American oystercatchers in response to declining prey densities. *Can. J. Zool.* 75: 170-181.

Tuckwell, J. and E. Nol. 1997. Intra- and interspecific interactions of foraging American oystercatchers on an oyster bed. *Can. J. Zool.* 75: 182-187.

Technical reports

Tuckwell, J. and T. Everest. 2009. Management Plan for the Black-tailed Prairie Dog (*Cynomys ludovicianus*) in Canada. Species at Risk Act Management Plan Series. Parks Canada Agency, Ottawa. vi + 31 pp.

Tuckwell, J. and T. Everest. 2009. Recovery Strategy for the Black-footed Ferret (*Mustela nigripes*) in Canada. Species at Risk Act Recovery Strategy Series. Parks Canada Agency, Ottawa. vii + 36 pp.

Wilmshurst, J., **Tuckwell, J.**, and T. Naughten. 2001. Satellite Monitoring of Northern Ecosystems 2000. Parks Canada, Western Canada Service Centre. Winnipeg, MB.

Wilmshurst, J., **Tuckwell, J.**, and T. Naughten. 2002. Satellite Monitoring of Northern Ecosystems 2001. Parks Canada, Western Canada Service Centre. Winnipeg, MB.

SUMMARY

Ms. Heather Cherry is an Impact Assessment Scientist, in the Natural Resource Management Branch, Protected Areas Establishment and Conservation Directorate, with Parks Canada. She supports the national impact assessment program at Parks Canada including:

- Parks Canada's involvement in major project assessments
- Strategic environmental assessments
- Program, policy and training for assessments on lands administered by Parks Canada, including those under the Impact Assessment Act, 2019 and previous legislation.

EXPERIENCE

2015 – present, **Impact Assessment Scientist, Natural Resource Management Branch, Parks Canada**

Provides support to the national impact assessment program at Parks Canada including:

- Parks Canada's involvement in major project assessments
- Strategic environmental assessments
- Program, policy and training for assessments on lands administered by Parks Canada, including those under the Impact Assessment Act, 2019 and previous legislation.

2011-2015, **Ecologist Team Leader – Environmental Assessment and Contaminated Sites, Northern Prairies Field Unit, Parks Canada**

Lead ecologist responsible for managing the environmental assessment, water quality, and contaminated sites programs for the Northern Prairies Field Unit, including Elk Island and Prince Albert National Parks.

2012-2013, **Environmental Planner, Stantec Consulting Ltd., Calgary, Alberta**

Provided project management support for environmental assessment, regulatory, permitting, and application requirements for private and public clients. Project work included pipeline installations, oil and gas tank terminals, oil sands expansions, railway and road activities, carbon capture and storage, and in-situ oil and gas activities.

2010-2011, **Resource Conservation/Communications Officer, Prince Albert National Park, Parks Canada**

Provided support for field work, study design, GIS, statistical analysis, and report writing for ecological monitoring programs and website communications.

2009-2010, **Pediatric Health Research Assistant, Alberta Research Centre for Health Evidence, Edmonton, Alberta**

Worked on research teams to conduct evidence-based systematic reviews of human health studies.

2006-2009, **Field Technician and Laboratory Instructor, University of Alberta, Edmonton, Alberta**

Participated in numerous projects including: a woodpecker habitat and forest management project (Foothills FMA and Jasper National Park), vegetation surveys for a

CWD project (East-central Alberta), a fescue grassland study (Ya Ha Tinda, Alberta), and taught undergraduate students in laboratory and field settings.

EDUCATION

Master of Science Degree in Ecology, University of Alberta, Edmonton, Alberta 2009

Bachelor of Science Degree, University of Alberta, Edmonton, Alberta, 2007

PUBLICATIONS

Journals

Merrill, E., Sand, H., Zimmerman, B., **McPhee, H.**, Webb, N., Hebblewhite, M., Wabakkan, P., and Frair, J. 2010. Building a mechanistic understanding of predation with GPS collar data. *Philosophical Transactions of the Royal Society, B* 365: 2279-2288.

McPhee, H., Merrill, E. H., and N. Webb. 2011. Time-to-kill: attack rates of wolves in a spatially heterogeneous, multi-prey system. *Oikos* 121: 711-720.

McPhee, H., Merrill, E. H., and N. Webb. 2012. Hierarchical predation: wolf selection along hunt paths and at kill sites. *Canadian Journal of Zoology* 90: 555-563.

Eri Hiraga, B.Sc. (Honours)
Impact Assessment Scientist, Natural Resource Management Branch
Parks Canada Agency
220 – 4th Avenue SE
Calgary, AB T2G 4X3

Curriculum Vitae

SUMMARY

Ms. Eri Hiraga is an Impact Assessment Scientist, Natural Resource Management Branch, Protected Areas Establishment and Conservation Directorate, with Parks Canada. She supports the national impact assessment program at Parks Canada including:

- Parks Canada's involvement in major project assessments
- Strategic environmental assessments
- Program, policy and training for assessments on lands administered by Parks Canada, including those under the Impact Assessment Act, 2019, and previous legislation.

EXPERIENCE

2018 – 2019, 2019-current, **Impact Assessment Scientist, Natural Resource Management Branch, Protected Areas Establishment and Conservation, Parks Canada Agency**

Responsible for supporting the national impact assessment program at Parks Canada, including:

- Parks Canada's involvement in major project assessments
- Strategic environmental assessments
- Program, policy and training for assessments on lands administered by Parks Canada, including those under the Impact Assessment Act, 2019, and previous legislation.

2019, **Environmental Planner, Jacobs, Calgary, Alberta**

Responsible for managing and supporting environmental assessments, permitting and regulatory applications, for resource projects in western Canada.

2015 – 2018, **Impact Assessment Officer, Waterton Lakes National Park, Parks Canada Agency**

Responsible for implementing the impact assessment program within Waterton Lakes Field Unit, including Waterton Lakes National Park and Bar U National Historic Site.

2013 – 2015, **Environmental Planner – Vegetation Ecologist, TERA, A CH2M HILL Company (CH2M Hill Energy Canada Ltd.), Calgary, AB**

Responsible for leading field programs and supporting environmental assessments, permitting, and regulatory applications for resource projects in western Canada.

2013 **Environmental Advisor, Vegetation Specialist, Nickpoint Environmental Services Inc., Calgary, AB**

Responsible for coordinating and leading field programs and supporting environmental assessments, permitting, and regulatory applications, including projects on federal lands.

2010 – 2013 **Vegetation Specialist, Ghostpine Environmental Services Ltd., Calgary Alberta**

Responsible for coordinating and leading field programs and supporting environmental assessments, permitting, and regulatory applications for upstream oil and gas projects in western Canada.

Eri Hiraga, B.Sc. (Honours)
Impact Assessment Scientist, Natural Resource Management Branch
Parks Canada Agency

Curriculum Vitae

EDUCATION

Bachelor of Science (Honours), Natural Resources Conservation, University of British Columbia, Vancouver, British Columbia, 2010

Bachelor of Science (Honours), Biology, Queen's University, Kingston, Ontario, 2004