Christopher Blackford

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EDUCATION

MSc. in Ecology and Evolutionary Biology. University of Toronto ***2015 - 2018***
Thesis title: "Connectivity coarse filter approach for Marine Protected Area Network Design"
Supervisors: Marie-Josée Fortin, Martin Krkošek.

BSc. Honours (with high distinction). University of Toronto ***2010 - 2014***
Double major in Environmental Biology and Psychology.
Thesis title: "Effects of germination segregation between two native Californian grasses on competitive ability and fitness." Supervisor: Benjamin Gilbert.

WORK EXPERIENCE

Land Resource Specialist, Ontario Ministry of Agriculture, Food, and Rural Affairs ***August 2020 – Current***
Updating and managing soil data to develop Digital Soil Maps throughout Ontario. Running soil-environmental databases through automated machine learning models to understand soil variation at a suite of sites across Ontario.

Forest Geoinformatics Research Analysist, Natural Resources Canada ***October 2018 – May 2020***
Using machine learning to understand relationships between environmental variables and important soil traits (moisture, texture etc.) across a large spatial extent in Ontario, Canada. Duties include developing an automated and reproducible workflow; testing effects of different environmental variables and data structure; and comparing performance of different machine learning approaches to develop standards for digital soil mapping.

Field Assistant, University of British Columbia ***April 2015 – August 2015***
Assisted in a project testing the effects of tributary loss and riparian vegetation on downstream river ecosystems. Duties included field equipment construction, flow and temperature measurement, invertebrate collection, water quality analysis (with probe), and sediment analysis.

Research Assistant, University of Toronto ***May 2013 – August 2013, May 2014 – December 2014***
Predicted boreal tree species range shifts under climate change. Duties included governmental data collection, data processing, data analysis, mapping, and report writing.

Research Assistant, University of Toronto ***September 2014 – December 2014***
In collaboration with NESCent research group (https://www.nescent.org), investigated cultural evolution using language diversity as a proxy. Duties included spatial analysis in ArcGIS as well as data processing in Microsoft Excel and R.

Greenhouse Assistant, University of Toronto ***January 2013 – May 2013***
Helped run an experiment on phylogenetic community assembly in plants. Duties included greenhouse maintenance, experimental design, planting, soil mixing, and biomass analysis.

Work-study Student, University of Toronto ***September 2012 – April 2013***
Helped run undergraduate participants through environmental psychology experiments investigating how people frame environmental issues in a local vs a global context and how they perceive "whistle-blowers".

PUBLICATIONS

Blackford C, Krkošek M, Fortin MJ. (*in review.*) A data-limited modeling approach for conserving connectivity in Marine Protected Area Networks.

Blackford C, Heung B, Baldwin K, Fleming RL, Hazlett PW, Morris DM, Uhlig P, Webster K. 2020. Digital Soil Mapping workflow for forest resource applications: A case study in the Hearst Forest, Ontario. *Canadian Journal of Forest Research.* doi: 10.1139/cjfr-2020-0066.

Blackford C, Germain RM, Gilbert, B. 2020. Species differences in phenology shape coexistence. *The American Naturalist*. doi: 10.1086/708719.

D'Aloia CC, Naujokaitis-Lewis I, **Blackford C**, Chu C, Curtis JMR, Darling ES, Guichard F, Leroux SJ, Martensen AC, Rayfield B, Sunday JM, Xuereb A, Fortin MJ. 2019. Coupled networks of permanent protected areas and dynamic conservation areas for biodiversity conservation under climate change. Frontiers in Ecology and Evolution 7: 27. doi: 10.3389/fevo.2019.00027.

PRESENTATIONS (*presenting author)

Blackford, C.*, Heung, B. & Webster, K. (July 2019). Digital Soil Mapping for Enhanced Forestry Management in Ontario, Canada [Talk]. *Canadian Society of Soil Science 2019*. Saskatoon, Canada.

Blackford, C.*, Heung, B. & Webster, K. (June 2019). Supporting Enhanced Forest Resource Inventories using Machine Learning for High-Resolution Digital Soil Mapping [Talk]. *Pedometrics 2019*. Guelph, Canada.

Blackford, C.*, Fortin, M.J. & Krkošek, M. (July 2018). Coarse Filter Approach for Marine Protected Area Network Design under Current and Future Climate Scenarios [Talk]. *North American Congress for Conservation Biology 2018*. Toronto, Canada.

Blackford, C.* & Fortin, M.J. (May 2017). Protected areas: How to design resilient networks using connectivity. [Talk]. *Canadian Society for Ecology & Evolution Meeting 2017*. Victoria, Canada.

Blackford, C.* & Fortin, M.J. (May 2017). Identifying priority conservation areas for data-poor marine species. [Poster]. *CHONe II Network Meeting.* Gatineau, Canada.

Blackford, C.* & Fortin, M.J. (May 2016). Working towards an optimal Marine Protected Area network design in the Canadian Pacific Ocean. [Talk] *The 46th Ontario Ecology, Ethology, and Evolution Colloquium (OE3C*). Toronto, Canada.

Blackford, C.* & Gilbert, B. (May 2014). Effects of germination segregation between two native Californian grasses on competitive ability and fitness. [Talk]. *The 44th Ontario Ecology, Ethology, and Evolution Colloquium (OE3C*). Guelph, Canada.

Blackford, C.* & Gilbert, B. (April 2014). Effects of germination segregation between two native Californian grasses on competitive ability and fitness. [Poster]. *University of Toronto undergraduate research fair*. Toronto, Canada.

TEACHING

Teaching Assistant, University of Toronto ***2015 – 2018***

BIO120 – Adaptation and Biodiversity. First year undergraduate course that introduces core concepts of ecology and evolution.

ENV234 - Environmental Biology. Second year undergraduate course that draws on elements from geology, soil science, biology and ecology to understand past and present environments and human impacts on landscapes and ecosystems.

ENV334 - Environmental Biology: Applied Ecology. Third year undergraduate course that focuses on human-managed ecosystems (e.g. agro-ecosystems), bio-indicators of anthropogenic impacts, ecosystem restoration, adaptive management, and local management/restoration issues.

In addition to the typical duties of a teaching assistant (teaching labs, grading lab reports, meeting with students for academic advice), I developed and delivered a TA feedback survey to the students at the end of the semester to identify my strengths and how to improve as an educator.

Undergraduate Mentor, University of Toronto ***July 2017***

Assisted in the design and implementation of an undergraduate research project that studied parasite (sea lice) preference for different salmon species. This field work was conducted on a boat in the Broughton Archipelago (British Columbia coast).

VOLUNTEER EXPERIENCE

Board Member, Society for Conservation Biology – Toronto chapter ***October 2015 – 2018***

Held many roles including Treasurer, Communications Manager and Vice-President of SCB-Toronto (www.scbtoronto.com). Specific contributions include organizing events, managing finances, and assisting in running social media (website, Facebook, Twitter).

Lead Organizer, North American Congress for Conservation Biology 2018 ***December 2015 – July 2018***

Involved in many tasks including venue selection, promoting conference to local academic institutions, estimating environmental cost of participants travel for carbon offset calculations, and organizing volunteers for the conference.

Volunteer facilitator, Royal Ontario Museum ***2015 – 2016, Sept. 2017 – June 2018***

Volunteer facilitator in the "Hands on Biodiversity" gallery at the ROM. Educated and excited visitors about biodiversity; using a Socratic approach to guide children to the right answers without outright lecturing them.

Fundraising chair, University of Toronto's Ecology and Evolutionary Biology Graduate Student Association (EGSA) ***September 2016 – May 2017***

Ran the annual charity drive for the EGSA. Helped the department select preferred charity, raising $565 for the selected charity (Against Malaria Foundation).

Social Media/IT coordinator, Ontario Ecology, Ethology, and Evolution Colloquium 2016 (OE3C2016) ***September 2015 – May 2016***

Designed and ran OE3C2016 website (https://oe3c2016blog.wordpress.com/) using a wordpress template, set up the Paypal payment system for the colloquium, and helped design the online registration process.

TECHNICAL SKILLS

Proficient in:

> R statistical software including automated data organization/manipulation, machine learning models, and spatial/statistical analysis. Check out my github page (github.com/Christopher-Blackford) for games, web apps, and other fun scripts.

> GIS software (e.g. ArcGIS, QGIS, SAGA GIS)

> Microsoft office programs including: Word, Excel, PowerPoint

> Ontario tree identification

> Freshwater flow, sediment and invertebrate sampling methods