

Biodiversity monitoring and AI modelling

Project – Development of a multi-indicator approach for biodiversity monitoring in Quebec

We are seeking a motivated postdoctoral fellow (PDF) to join a dynamic, multi-institution research group to support the development of biodiversity monitoring and modelling tools to track biodiversity change in restored and protected forest sites across the Saint Lawrence Lowlands using a range of data sources and tools. The recruited PDF will work closely with institutional partners at **Habitat**, an environmental research company, in the development of analytical workflows to measure, track and monitor change in biodiversity indicators relevant to the emerging biodiversity credits and uplift market in Quebec. Research will focus on how to meaningfully link ecological and biological information across scales from the level of a small reforestation site up to landscapes following best ecological principles for the purpose of detecting change in ecosystems and biological communities.

Embedded in a larger **Environment and Climate Change Canada** supported project led by Habitat, the specific research objectives are (i) follow scientific and sector advancements in the emerging biodiversity credits market to identify relevant biodiversity indicators related to the landscapes, ecosystems and projects of interest to Habitat, (ii) research and develop novel approaches for monitoring biodiversity change with indicators via the integration of multiple sources of field and remotely derived biological or ecological information (e.g. field surveys, acoustic sensors, camera traps, LiDAR, satellite imagery) across spatial scales, (iii) apply these in the development of an integrated, multi-scale modelling workflow using R, Julia, and/or Python and (iv) test the platform using available data for a chronosequence of reforested sites in southern Quebec.

The PDF will be part of a multi-institution federally (**ECCC**) and provincially (**MELCCFP**) supported research program on *'Monitoring for success: Developing a connectivity-based biodiversity modeling framework and monitoring plan'* with **Habitat**. The project aims to develop innovative tools and approaches to track changes in biodiversity from reforestation actions in agricultural landscapes. The PDF will join the dynamic research laboratory of **Dr. Laura Pollock** at **McGill** and will be embedded in the researcher group at Habitat, and further supported by expertise of the founding associates of Habitat Dr. Andrew Gonzalez (Dept. Biology, McGill; biodiversity, connectivity, ecosystems), Dr. Jérôme Dupras (UQO; ecological economics) and Dr. Christian Messier (UQAM; forest sciences and management). The PDF will work alongside two other PDFs recruited through Mitacs program with expertise in artificial intelligence and ecological economics.

ESSENTIAL DUTIES

The primary responsibilities of the successful candidate will be to conduct innovative research in collaboration with a diverse group of university scientists as well as their industry partners (Habitat). The specific duties will include the conception of novel techniques to link multiple sources of biological and ecological information across scales to track biodiversity change; development of an integrated modelling workflows using Python, Julia and/or R; report writing; and the preparation of manuscripts in collaboration with the supervisors. The successful candidate will also be responsible for training graduate



students, contributing to on-going projects with industry partners as appropriate and contributing to the development of competitive research grants as needed.

SKILLS AND QUALIFICATIONS

Applicants must have completed a Ph.D. in a relevant discipline within the last three years and have primary publications in refereed, English language journals, the ability to work cooperatively with the supervisors, and strong organizational skills. Ability to speak French will be considered an asset.

The ideal candidate will have a background in biodiversity conservation, ecology and expertise in computer programming, and have worked with multiple sources of biological information (field surveys, remote sensing, recordings, etc). In addition, candidate should have high fluency in programming languages (Python, Julia or R), and experience with management and analysis of large spatial datasets and/or working in geospatial platforms. Experience with machine learning algorithms (e.g. neural networks, RandomForests) is also considered an asset. In addition, we seek a PDF with a desire to develop novel methods to assess and monitor ecological change. We value creative and autonomous thinkers used to working in an interdisciplinary setting.

Terms and conditions

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Start Date: As soon as possible

Salary: \$50 000 per annum + benefits

Duration: 2 years

Institute: McGill University, Dept. Biology / Habitat

Location: Montréal, Québec

Supervisors: Dr. Laura Pollock and Dr. Sylvia Wood (Habitat, R&D)

To apply

Please send a cover letter describing your research background, interests, and qualifications; two example publications demonstrating your relevant research experience; plus, a complete curriculum vitae and contact information for at least two references to laura.pollock@mcgill.ca and sylvia.wood@habitat-nature.com.

Application deadline: Open until filled. Only short-listed candidates will be notified.

