Ph. D. OFFER: How Forest Management Shapes Post-Fire Regeneration in Québec's Boreal Forests

Project: In 2023, Québec experienced the largest wildfire season in its history, with vast areas of boreal forest affected — many of them previously managed stands. Fire is a natural and essential disturbance in boreal ecosystems, and key species such as black spruce (*Picea mariana*) and jack pine (*Pinus banksiana*) have evolved life strategies tightly linked to fire. However, modern forest landscapes are no longer purely "natural". Planting, thinning, removal of broadleaf trees, and salvage logging have profoundly altered forest structure before and after fire. As a result, today's post-fire regeneration does not necessarily follow historical patterns. A key question remains: **How does forest management before fire influence the capacity of forests to recover naturally after fire?**

Understanding this is critical for predicting future forest resilience and for adapting silvicultural practices under climate change. **This Ph. D. project will explore how the legacy of pre-fire silvicultural treatments** shapes post-fire regeneration dynamics in Québec's boreal forest. The student will investigate how management history influences seedling establishment and mortality, sapling growth and productivity, understory development and microsite availability after wildfire. The work will focus on emblematic boreal species such as **black spruce and jack pine**, combining field ecology with ecophysiology. Fieldwork will take place in **Nord-du-Québec**, using a unique network of recently burned plots where regeneration and abiotic conditions (soil moisture, temperature, substrate, microsites) are monitored over time. The project follows regeneration through time, capturing both **short- and mid-term dynamics**, and offers opportunities to develop skills in field ecology, plant physiology, statistical modeling, integrative forest science.

Candidate Profile: We are seeking a motivated candidate with a master's degree in forestry, ecology, biology, plant sciences, or a related field. The ideal candidate: has a strong interest in **plant ecology and physiology**, enjoys both **fieldwork and data analysis**, is curious, creative, and autonomous, and values teamwork in a supportive research environment. A positive and persevering attitude is highly valued — science is challenging, but also fun when done together. **We are committed to equity, diversity, and inclusion and encourage applications from candidates of diverse backgrounds, including individuals from groups traditionally underrepresented in ecological and forest sciences**.

Research Environment & Supervision: The Ph. D. will be conducted at the Forest Research Institute (IRF) at the Université du Québec en Abitibi-Témiscamingue (UQAT) in Rouyn-Noranda, Canada. Supervision will be provided by **Valentina Buttò**, specialist in functional ecology and forest modeling (IRF-UQAT) and **Annie DesRochers**, specialist in silviculture and forest ecophysiology (IRF-UQAT). The student will enroll in the doctoral program **Doctorat en écologie et aménagement des écosystèmes forestiers** at UQAT. IRF-UQAT offers highly personalized supervision in a close-knit, collaborative research environment. UQAT is a French-speaking university, but free French courses are available, and international students receive strong institutional support for academic and personal integration. **English-speaking students are fully supported, and specific accommodations are available to ensure their successful participation in coursework and research activities.**

Funding & Start Date: Scholarship: $24,000 CAD/year; **Start date:** Summer or Fall 2026, but flexible also depending on candidates' availability. International students may benefit from a special welcoming scholarship aimed at covering part of the tuition fees.

How to Apply: Interested candidates should send a CV, a short cover letter describing research interests and motivation, unofficial transcripts, and contact information for two referees to: valentina.butto@uqat.ca and annie.desrochers@uqat.ca.

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