PhD Position in the field of Conservation of Ecosystem Services and Landscape Planning
Département de phytologie, Université Laval, Québec, Canada

Start Date: January, May or September 2020
Salary: $20,000/year + possibility to get $16,000 for the entire duration of studies from academic support funds if objectives are completed on time
Duration: 4 years
Location: Based at Laval University, Québec city
Supervisors: Dr Monique Poulin (ULaval), Dr. Stephanie Pellerin (Univ. of Montreal), Dr. Jerome Cimon-Morin (Ministry of Forests, Fauna and Parks, Qc).

Goal:
We are seeking an exceptional PhD candidate to conduct research on conservation of ecosystem services (ES) and landscape planning. The project will be conducted in peatlands and forests of the Côte-Nord region, that will be used as model systems to develop our knowledge on best management strategies for achieving sustainability in Québec’s human-dominated landscapes. We will address the general question of how to set conservation and restoration priorities without impeding economic development.

Research context:
The Côte-Nord region is dominated by forests and wetlands, while forestry and peat extraction are main economic pillars. The peat industry is dependent on good-quality peat, which has proved to be virtually irreplaceable as a growing substrate for horticultural products. This industry has developed basic criteria for selecting harvesting sites in accordance with socio-environmental concerns such as social acceptability and rarity of specific habitats, but lacks tools to integrate multiple ecosystem services. This
industry is also in need of reliable methods to consider trade-offs between conservation and development to ensure the lowest possible environmental footprint regionally. The forest industry is dependent on actual wood stock as well as on the capacity of forests to regenerate after harvesting. Natural forests play crucial roles in climate regulation by stocking carbon through live biomass, but also contribute to reducing surface albedo and thus to increasing temperatures by absorbing a large part of sun radiance. Studying trade-offs between carbon stocking and reduced albedo after tree plantations would help decision making within this industry, particularly for northern forests.

Approach:

We will first compare two modelling approaches to prioritize conservation sites: the hot spot approach, based on spatial concordance of ES, and the Systematic Conservation Planning approach, which focuses rather on site complementarity. We will estimate costs (area and number of sites selected in conservation networks and associated losses of resources extraction potential) and benefits (conservation targets achieved) for both approaches. Second, we will assess the cost/benefits ratios of plantations after tree harvesting. Plantation scenarios will be assessed for evergreen coniferous (Picea glauca), deciduous coniferous (Larix laricina), and deciduous broad leaf species (Betula alleghaniensis), notably in regard to their effect on albedo and thereby on climate regulation. Third, we will evaluate the cost of postponing ES conservation planning under different scenarios of future industrial development. Site selection procedures and landscape planning will be performed using programs such as Marxan, Woodstock and Landis.

Profile:

Applicants must have completed a Master in the field of Ecology, Biology, Geography, Natural Resources, or a related field and have good knowledge or interest in biological conservation, notably on aspects related to ecosystem services and systematic conservation planning. Experience with scientific publications would be a great advantage. Speaking and reading French will be considered as a great asset as the candidate will integrate a French speaking team. At least he (she) should be ready to learn the basics of
French. He (or she) should have good data management, GIS, and scientific writing skills. The candidate should have strong aptitudes for collaboration with other team members and partners.

**ResNet**

The project is part of a pan-Canadian network called ResNet, supported by the NSERC strategic network program. This network involves 26 researchers, 11 universities, 30 collaborators and 17 partner organizations to address important questions about the management and future of Canada’s working landscapes and the critical ecosystem services they provide. The candidate will interact with these people through workshops and meetings.

**To apply**, please send a cover letter describing your research background, interests, and qualifications; plus a curriculum vitae and contact information for at least three references to monique.poulin@fsaa.ulaval.ca.

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

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