

# **Ecological Restoration: Nature-Based Solutions for Climate Mitigation and Engaging Canadians with Nature**

## **About the project:**

Ecological restoration is an increasingly prominent practice to address urgent environmental challenges that threaten nature and the benefits humans derive from it. Canadians have played an outsized role in leading and developing the field of ecological restoration. Practically every type of restoration practice is represented in Canada, from large-scale tree planting to school yard rewilding, from long-term research restoration projects to pop-up urban restoration. Our focus was to complete the first comprehensive and systematic examination of ecological restoration in Canada. Much has been achieved, but how can we build on this accomplishment to make Canada an undisputed global leader in ecological restoration?

Our project was guided by two objectives: 1) Synthesize and critically assess the state of ecological restoration knowledge in Canada; and, 2) Identify and assess restoration policy (or policies related to restoration) in Canada. These objectives were met through a variety of methods. First, by using a systematic literature review on over 3000 relevant articles associated with ecological restoration in Canada. A series of cross-Canada practitioner interviews were conducted with 69 restoration professionals. We used three case studies to take a deeper dive into policy effectiveness: Atlantic salmon recovery in Fundy National Park (single case with interviews of a major force in ecological restoration - Parks Canada), peatland restoration (reviewing literature from a long-term industry-driven research partnership for responsible management), and Garry oak ecosystem restoration (management literature reviews, professional literature reviews, and semi-structured interviews).

## **Key findings:**

- Restoration in Canada is collaborative, both in the co-production of knowledge and in the development and implementation of restoration projects. Funding structures and incentives should continue to promote collaborative restoration projects.
- Published academic literature is shifting towards climate change impacts and the potential of restoration to mitigate climate change impacts - this finding has a clear policy link for incorporating restoration as a climate change management tool in new climate policy.
- Several ecosystems are underrepresented in the literature: aquatic, arctic, and alpine ecosystems, and those facing intense pressure in urban environments. These should be the focus of new research, particularly because of the significant impact of climate change on aquatic, arctic, and alpine ecosystems.
- Management literature from government agencies, NGOs, or community groups is difficult to access, which presents challenges for researchers aiming to synthesize knowledge amassed at the community level and in private practice. Research efforts to identify structures and processes that would bridge the gap between practice and research would help mobilize that knowledge.
- Canadian ecological restoration literature shows wide collaboration and variation in terms of approaches, but it is concentrated in a few locations, particularly where primary extractive resources occur (e.g. Alberta, Sudbury and Quebec). The variables used to measure the outcomes

of restoration interventions varied widely, making it challenging to compare across projects. Although practitioners could access peer-reviewed literature, many lacked time to read it.

- Semi-structured interviews with restoration specialists revealed that Canadian ecological restoration is still emerging, and faces challenges such as lack of political will and financing. However, momentum for restoration action can be generated by raising public awareness of the practice and showcasing success stories to help connect people to nature locally.
- Early and continuous engagement of diverse stakeholders is perceived by practitioners as the most important factor in the ongoing restoration of Atlantic salmon at Fundy National Park.
- For almost 30 years (since 1992), the research team of the Peatland Ecology Research Group in collaboration with the Canadian peat industry has developed an efficient partnership, established two research stations (bog and fen) akin to the Long Term Ecological Research of National Science Foundation program, and developed a recognized approach to restore degraded peatlands.
- Funding mobilized for species-at-risk recovery facilitated the development of knowledge-sharing infrastructure that supports Garry oak ecosystem restoration, and community interest in an at-risk ecosystem has supplemented restoration funding with a long-term volunteer base.

### **Policy Implications:**

Our interviews and case studies indicated that restoration policy in Canada exists mainly within a few institutions rather than being systematic. Existing conservation-focused policies such as the federal Species-at-Risk (SAR) legislation and industrial reclamation requirements are supporting restoration efforts. However, there are few explicit references to ecological restoration in policies, and fewer still in legislation that would facilitate development of policies. For example, SAR is case specific, and only facilitates wider ecosystem restoration if it is an umbrella species or restoring habitat has a halo effect of restoring it for many species and ecosystem functions. Parks Canada is an exception as it specifically connects ecological restoration as an important means of achieving the legislated mandate of maintaining or restoring ecological integrity (and produced the first national-level comprehensive principles and guidelines for restoration in the world). Ideally, governments and organizations would consolidate and refine principles, guidelines, and policies on ecological restoration. This could build on the original Canadian principles of “effective, efficient and engaging” restoration, tie these into emerging international guidance, and create comprehensive guidance and support tools and funding aimed at improving restoration outcomes.

### **Further information**

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