

Environmental assessments should factor in ecological connectivity, say researchers

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There is a growing call among researchers, funding bodies and developers to integrate considerations of ecological connectivity in environmental assessments (EAs) of proposed development projects.

This refers to the degree to which a natural landscape remains unbroken by a development project, be it a road, mine, transmission line or hydro dam. These projects have the potential to impede wildlife movement across altered z, with important consequences for migration, genetic diversity, population abundance, climate resilience, disease resistance and more.

In a series of papers published in a [special issue](#) of the journal *Impact Assessment and Project Appraisal*, led by two Concordia researchers and Spanish researcher Aurora Torres from Alicante, the authors look at how ecological connectivity can become central to EAs. [Their concluding paper](#) looks at five [case studies](#) that demonstrate how, despite major differences in the characteristics of the projects, the issue of connectivity can be successfully included at the EA stage.

"We wanted to take a closer look at the details and success factors in these different case studies to see what we can learn for new projects, including Quebec," says Jochen Jaeger, an associate professor in the Department of Geography, Planning and Environment in the Faculty of Arts and Science and the paper's supervising author. The case study method is helpful, he says, because there are few detailed guidelines practitioners can use to help them evaluate a specific project's effects on connectivity.

For example, most roads in Quebec have been built without any consideration of their effects on ecological connectivity, such as Autoroutes 15 and 10. These major mistakes should be corrected by adding wildlife passages, and the Initiative québécoise Corridors écologiques, established by the Nature Conservancy of Canada, has pushed for the consideration of connectivity in land-use decisions for years.

However, the Quebec Transport Ministry usually refuses to add any

mitigation measures to existing roads. As a result, Quebec still does not have any wildlife overpasses, even today. Therefore, it is very important that connectivity will be adequately considered in the EAs for new roads and for the widening of existing roads from two to four lanes, and that sufficient mitigation measures be installed at least in these cases.

Finding common features

The study looked at five projects in four countries: the 850-kilometer natural gas Westcoast Connector Gas Transmission pipeline project in northeast British Columbia; Parks Canada's strategic EAs of its park management plans; the expansion of a third runway at Heathrow Airport in London, United Kingdom; the expansion of the Malmbanan railway in northern Sweden; and the upgrade of the A4 highway in southern Spain.

Despite the projects' differences, the researchers found commonalities of challenges, lessons learned and important future research directions.

The 15 challenges encountered touched on the limited awareness and understanding of the importance of connectivity among EA practitioners; [technical problems](#) such as a lack of quality data and difficulty in transferring knowledge between scientists and practitioners; and a need for better coordination between authorities across jurisdictions.

As for the 19 lessons learned, the case studies show that connectivity assessments should be based on scientific knowledge such as ecological characteristics and the need to consider multiple scales of analysis. The researchers also note that thinking about connectivity early in the EA benefits the process and reveals potential threats. The case studies demonstrate that various pathways can lead to successful inclusion of connectivity, not just one.

Guidance needed

The case studies all reveal the need for guidance on when, why and how to conduct connectivity analyses, and which techniques or tools should be used. They also identify the need for monitoring to see if the projects' restoration and conservation efforts attain their goals.

The researchers hope that the special issue will lead to legislation that requires connectivity considerations become mandatory in EAs, and that governments enact regulatory frameworks to maintain appropriate standards and enforcement measures.

"This was a passion project from the very beginning," says lead author Charla Patterson, who recently completed her Master of Environmental Assessment at Concordia.

"After presenting our research as part of an online workshop, the original core purpose of improving the consideration of ecological connectivity in EA became the foundation of a working group. From there, things evolved organically. It was truly humbling to work alongside so many talented and brilliant people over the course of this project. These are people from multiple countries, working across different sectors in EA who volunteered their time over the last couple of years because they believe in the importance of this work. It was not always easy, but it was definitely worth it.

"It was also very encouraging to see that professionals across different sectors recognized the importance of connectivity and agreed that it should be included in EA."

More information: Charla Patterson et al, Pathways for improving the consideration of ecological connectivity in environmental assessment: lessons from five case studies, *Impact Assessment and Project Appraisal*

(2023). [DOI: 10.1080/14615517.2023.2246727](https://doi.org/10.1080/14615517.2023.2246727)

Aurora Torres et al, Advancing the consideration of ecological connectivity in environmental assessment: Synthesis and next steps forward, *Impact Assessment and Project Appraisal* (2022). [DOI: 10.1080/14615517.2022.2134619](https://doi.org/10.1080/14615517.2022.2134619)

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