



# Research Connections: Cumulative Effects

## Safeguarding forest biodiversity to facilitate restoration of in-situ oil sands landscapes

Note 11

**Lead Researcher:** David Langor **Project Type:** Cumulative Effects **Project Status:** Active (2021–2022)



Addressing  
**Cumulative Effects**  
of Natural Resource  
Development

### Need/Drivers

Disturbances have indirect effects on adjacent undisturbed forest, known as edge effects. These effects are not immediately evident nor sufficiently studied. The physical extent of edge effects in adjacent areas could range from a few metres to tens of metres. Due to edge effects, the amount of undisturbed habitat is likely less than what is currently believed to be represented and protected. Edge effects can influence regeneration of forest habitats and their constituent species on reclaimed sites. Despite the risks associated with edge effects, there is little information on edge effects in the western boreal and especially on the in-situ landscape. This creates a gap in the capacity to model and mitigate industrial footprints. This project will characterize the extent and severity of forest edge effects on industrial landscapes of the in-situ region of Alberta and how these effects may be mitigated through reclamation. Ultimately, this research is expected to lead to work focused on mitigating impacts of industrial activities through alternative planning and practices.

## Approach

The project will consist of a series of field experiments. The project team will sample forest biodiversity along transects, sampling both in the forest and, where possible, in adjacent disturbed areas. Additionally, environmental parameters will be measured along transects (e.g., light, soil moisture, tree basal area, blowdown).

This project has three overarching objectives. The first objective is to characterize the baseline biodiversity (i.e., assemblage structure, composition) in undisturbed sites across a broad range of forest ecosites and phases of reclamation in boreal Alberta. The second objective focuses on measuring the extent (i.e., distance of influence from the edge of the disturbance towards the interior of the forest) and nature of edge effects in forests adjacent to various disturbances on the in-situ landscape. Disturbances may include seismic lines, well pads, cut-blocks, burned areas and pipelines. This objective will allow the team to explore whether edge effects vary. The third objective of this project is the examination of the interaction between edge effects and reclamation. This will be done by assessing: 1) whether reclamation of disturbed sites (well pads, linear disturbances, etc.) can help adjacent areas recover from edge effects and 2) the influence of adjacent areas on species colonization dynamics of reclaimed sites.

## Anticipated Impacts

It is anticipated that this research will contribute to the improvement of reclamation practices to mitigate edge effects. It is expected to contribute to improved decision-making capacity concerning landscape fragmentation patterns that will minimize edge effects on biodiversity.



Pitfall trap used to collect ground-dwelling insects and spiders.

## Project Location

Northeastern Alberta

## CFS Team Members

David Langor, Tom Ramsfield, Brad Tomm, Jaime Pinzon, Anna Dabros, James Hammond, Tony Trofymow, Jean Berube, Greg Pohl, Philip Hoffman, Colin Myrholm

## Collaborators

Imperial Oil, Cenovus

## Indigenous Collaborators

Cold Lake First Nation (Alberta)