

Landscape Scale Successional Modelling for Restoration of Mineral Aggregate Extractive Sites on the Oak Ridges Moraine, Ontario, Canada

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Abstract

In June 2000, The Ministry of Natural Resources, Southcentral Science and Information Section initiated research strategies to address science related recommendations of the Ontario Living Legacy Round Table Report to develop a Landscape approach for the ecologically sustainable rehabilitation of mineral aggregate extraction areas. A significant challenge for mineral aggregate resource management is the comparative evaluation of large-scale long-term implications of different management, rehabilitation and conservation alternatives over large areas and for long time periods. To address this challenge, field investigations and data compilation have been focused on the Oak Ridges moraine, which provides an excellent illustration of the opportunities and constraints for conservation and rehabilitation that may exist on a complex geomorphological feature in an area of significant cultural development and land use competition. A landscape ecology approach and GIS based spatial analysis techniques have been adopted as unifying strategies in the organization of the project because of their ability to quantitatively evaluate the implications of conservation and management approaches at regional scales and over long time periods.

GIS based simulation of alternate extraction scenarios was undertaken as the basis for the quantitative evaluation of a range of alternative successional trajectories, which may occur, in different ecological contexts. Evaluation of alternate future landscapes using a modified version of LEAP and FRAGSTATS software permits the development of landscape scale approaches to mineral aggregate extraction and rehabilitation which optimize a range of landscape metrics.

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