

Sudbury, Canada- 25 Years of Municipal Action in Healing and Creating a New Terrestrial Ecosystem on a Smelter Impacted Landscape

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By the mid 1970's a hundred years of industrial activity (nickel and copper mining and smelting) in the Sudbury area had resulted in 17 500 ha of land with no vegetation and another 64 000 ha of semi-barren birch woodland. The City of Sudbury's Land Reclamation Program commenced in 1978, directed by a Municipal advisory committee (VETAC or Vegetation Enhancement Technical Advisory Committee). In addition there is a partnership with the reclamation activities of the two mining companies in Sudbury. Approximately 3500 ha of acid metal-contaminated land have been treated, mostly with a single application of dolomitic limestone (10 t/ha), fertilizer (400 kg/ha) and a grass-legume mixture (40kg/ha). Over 7 million trees have also been planted at densities of 300-500 per ha, with an average survival rate of *ca* 70%. Conifers dominant the 17 species used, especially *Pinus banksiana*, *Pinus resinosa*, *Pinus strobus* and *Picea glauca*. The developing ecosystem has become a mixture of the planted trees, in a matrix of natural invaders of *Betula*, *Populus* and *Salix*. In addition over 75 species of herbs, mosses and lichens contribute to the plant biodiversity. Plant growth and biomass are similar to control areas outside Sudbury; metal content is slightly elevated. The outcome of the reclamation program is a significant new image for the city and surrounds. This improved image has helped to attract new business enterprises, tourists and increased respect for the environment. Reclaimed areas support wild life, and are used for recreation and support walking trails. In this 25th year of operation a thorough review is in progress with an emphasis on the long-term viability of the developing ecosystems.

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Photo Essay



Photograph 1. Typical barren area



Photograph 2. Early spring view of hilltop 9 years after seeding and 7 years post planting of Jack Pine (*Pinus banksiana*)



Photograph 3. Mixture of Red (*Pinus resinosa*) and Jack Pine (*P. banksiana*) at Wahnapiatae, 24 years post planting. White Birch (*Betula papyrifera*), before leaf-out, has colonized the hillside.



Photograph 4. The woodland matrix with similar species to photograph 3, 20 years after planting of conifers.



Photograph 5. Coniston, one surrounded by black barren hills, is now surrounded by wooded hills.



Photograph 6. A suburb of Sudbury with hills covered by birch and planted conifers, 20 years old. Sudbury has 330 lakes and this picture shows the close connection and interaction between land and aquatic systems.



Photograph 7. Opening of Jane Goodall Reclamation Trail by Jane Goodall (left). This self guiding trail explains the process and changes following reclamation. Reclaimed land in the Sudbury area now offers many recreational opportunities.



Photograph 8. Contrast: old and new 'forest' of Sudbury.