VEGETATION RECOVERY ON ABANDONED BORROW PITS

Marie-Ève Marin[1,3], Sandrine Hugron[1,], Stéphane Boudreau[2,3] & Line Rochefort[1,3]
[1]Peatland Ecology Research Group, Université Laval, Qc
[2]Département de biologie, Université Laval, Qc
[3]Centre for Northern Studies, Université Laval, Qc

Key Words: road construction, mineral substrate, restoration

The formation of borrow pits results from the extraction of sand and gravel needed for road construction. The primary colonization of this inorganic substrate can be very slow, specially in stressful environments, as northern and alpine environments. Several factors, such as instability, poor water and nutrient retention and lack of propagules, limit the establishment of plants on abandoned borrow pits.

The research project presented aimed to develop solutions for the restoration of disturbed environments where mineral substrate is exposed by using native plants. Two approaches were considered. In the first place, an experimental approach allowed to test the effect of various substrate on the establishment of 3 typical vascular plants of the boreal forest, such as the glandular birch, the black spruce and the common Labrador tea. The different types of substrate tested were : (1) bare soil (2) amendment of peat, (3) glandular birch branch mulch, (4) fragmented community of *Racomitrium canescens* and *Stereocaulon paschale* and (5) dense naturally established communities of mosses and/or lichens. Preliminary results showed that the black spruce and the Labrador tea showed a better survival rate than the glandular birch, independently of the type of substrate on which it was grown. The preliminary results, taken after one growing season suggested that black spruce and Labrador tea would be good candidates for the restoration of disturbed environments where mineral soil is exposed, such as borrow pits. Among the various types of substrate tested, a branch mulch seamed to favor the establishment of transplanted seedlings on borrow pits by modifying the microclimatic conditions at the interface air-soil (as shown on figure 1), while fragmented community of mosses and lichens seems to favour seeds

germination (as shown on figure 2). Those data were collected after one growing season. The results of vascular plants introduction after one year will be shown during the presentation. They were not available by the time this abstract was written.

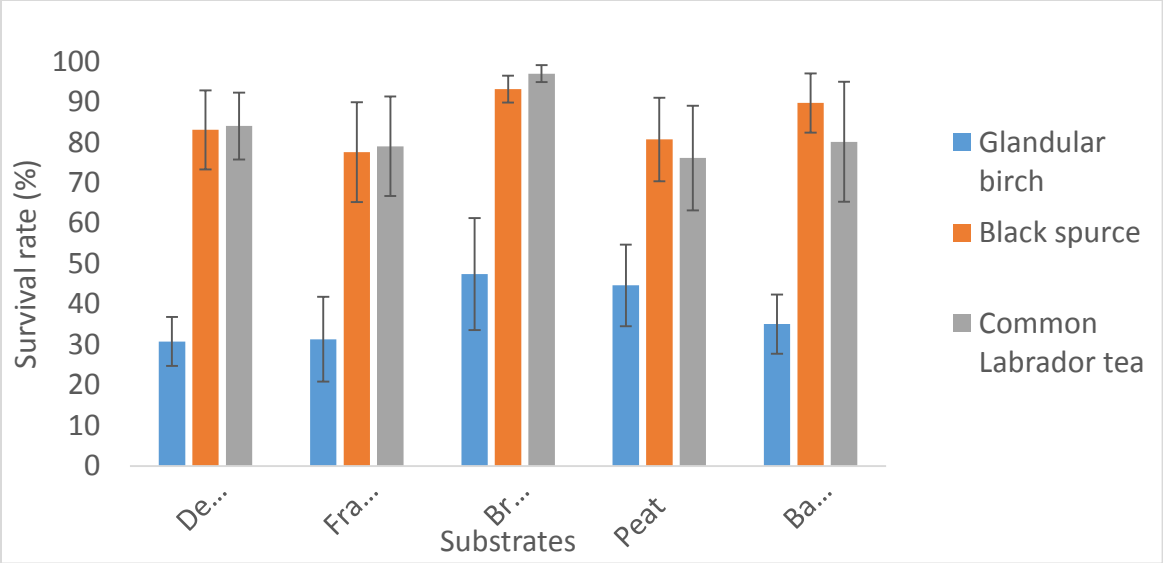

Fig. 1 : Survival rate of introduced seedlings on borrow pits after one growing season according to the substrate in which they were planted.

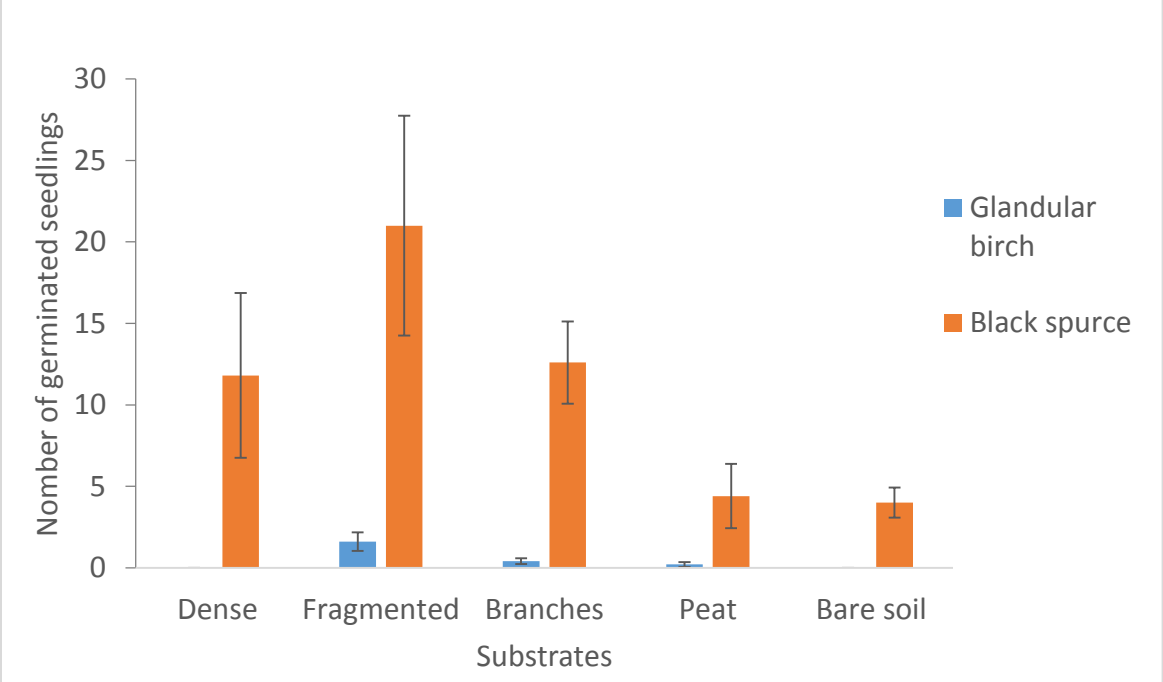

Fig. 2 : Quantity of germinated seeds on borrow pits after one growing season accordind to the substrate they were introduced in.

Secondly, plant establishment following restoration by the transfer of the organic substrate (including plant roots, seeds and aerial parts) on mineral roadsides was evaluated. The figure 3 illustrate the restoration technique. The results showed a fast vegetation recovery. The evaluation of several sites, allowed suggesting various options for the optimization of this technique.

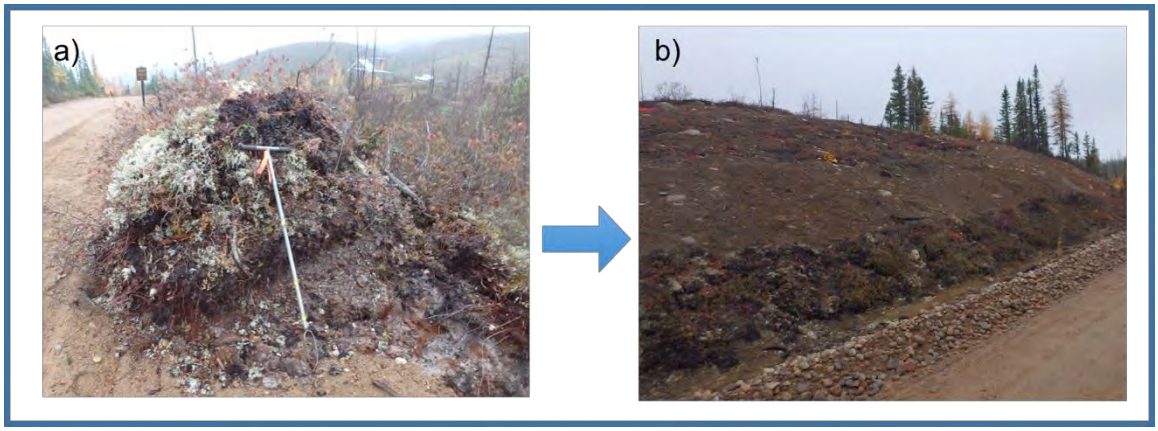

Fig. 3 : Illustration of the transfer of the organic substrate technique used to restore borrow pits and mineral road side. a) The pile of material conserved for the restoration. b) Organic material once spread on the road side.

41st CLRA National Annual General Meeting and Conference

McIntyre Arena, Timmins, Ontario

June 26-29, 2016

PROCEEDINGS

CLRA | ACRSD

Canadian Land Reclamation Association
Association canadienne de réhabilitation des sites dégradés