

Protecting forest floor in place rather than stripping it off is a better strategy to regenerated temporary drilling pads

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The Challenge

In situ extraction of oil sands reserves requires the production of many temporary exploration drilling pads to assess the bitumen layer. In these operations the forest floor and topsoil can be stripped off, stockpiled and replaced after drilling. As a result, many of these pads are slow to recover native forest vegetation. In this experiment we assessed if the forest floor could be left intact and if it might simply be covered during the drilling operation. We assessed the effectiveness of such protection techniques to regenerate aspen sprouts compared to stripping off and replacing the forest floor, and secondly compared to operational clearcutting.

The Approach

A boreal mixedwood forest was operationally clearcut in late fall near Conklin, Alberta. In the winter, we prepared 6 pads in a gently sloping section of the harvest area. On each pad, the forest floor was stripped off the upper half of the pad (cut side) and stockpiled (Fig 1, A). The forest floor on the lower half was protected by subsoil moved from the upper half (Fig 1, B). The pad was levelled and trafficked with heavy machines; after 3 weeks (to simulate drilling) the covering subsoil was moved back up slope and re-contoured and topsoil was returned. Regrowth of aspen was assessed after 1 and 2 growing seasons and this was also compared to adjacent clearcut-harvested areas.

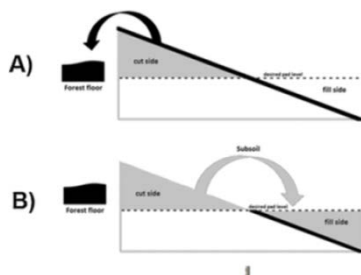


Fig 1. (A) Stripping off the forest floor on the upper slope, and (B) covering the forest floor on the lower slope with subsoil.

The Results

On the lower side of the pad, where the forest floor was protected from disturbance, there were approximately 10 times as many aspen sprouts that were at least 3 times as tall as sprouts in the upper side where the forest floor was stripped off and rolled back after re-contouring. Furthermore, the protected areas had at least as many vigorous suckers as in the adjacent clearcut (control) sites. Therefore, moderate amounts of disturbance in protected areas had little influence on the aspen recovery in comparison to the clearcut areas.



Fig 2. First growing season. Left: Upper slope stripping and rollback. Right: Forest floor protection.

Management Implications

- Covering and protecting the forest floor in place will result in rapid recovery of aspen, such as a normal early successional trajectory. Preliminary assessments indicate that most of the understory plants also resprouted.
- Training of machine operators to instill in them the importance of not damaging the forest floor during the building of the pad and the identification of the forest floor layer during the removal of the subsoil during the clean-up phase is critical for the success of this treatment.

Further Reading

Sascha Bachmann, Victor J. Lieffers *, Simon M. Landhäusser 2015. Forest floor protection during drilling pad construction promotes resprouting of aspen. *Ecological Engineering* 75:1-15.

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