

Study reveals that logging debris suppresses development of an invasive competitor, Scotch broom

April 2 2010

Countless studies and reports exist describing how a landscape is impacted after logging Douglas-fir: What is the impact on the soil? Should one leave the debris in place? Pile it? Burn it or haul it offsite in preparation for replanting the area in the future?

However, few studies have examined this hypothesis: Is it possible, that the debris remaining on the ground after logging may actually suppress competing vegetation resulting in a positive effect on the survival of Douglas-fir seedlings?

At a variety of clearcut sites, research forester Tim Harrington, noticed that plant invaders were sparse when the debris was left behind. He also began to reason that the method of dealing with debris might indirectly affect the survival and growth of conifer seedlings by way of its impact on vegetation that managers may consider a nuisance.

Harrington and Virginia Tech professor, Stephen Schoenholtz, conducted two studies to quantify the effects of different levels of logging debris on the productivity of Douglas-fir. These experiments compared the effects of dispersing, piling, and removing logging debris on the 5-year survival and growth of planted Douglas-fir seedlings at logging sites near Matlock, Washington, and Molalla, Oregon.

"I found that Scotch broom was the key woody competitor at the first

location," Harrington says, "and blackberry was rampant at the second." Three treatments were tested at each site: Only harvested logs were removed, leaving branches and treetops; aboveground portions of entire trees were removed; or logs were taken and branches and tops were piled at the site. "By the second or third year of the research, the amount of terrain covered by the key invasive (Scotch broom or blackberry) was much greater where debris had been piled or removed," Harrington explains, adding that as broom cover at the Matlock site increased to 40 percent, Douglas-fir seedling survival decreased by 30 percent. At the Molalla site, stem growth of the young trees decreased by 30 percent as blackberry cover increased to 80 percent. Dispersed logging debris also suppressed development of other invasive plant species, including oxeye daisy and velvet grass.

Some of the other findings of the study include:

- Debris decays, releases nutrients, adds to soil productivity.
- Mineral soil is exposed when debris is piled or removed, allowing native plants to be squeezed out while invasive plants grow rapidly.
- Removal of debris also removes a good source of carbon and nitrogen needed for forest productivity. The problem is especially severe on low-productivity sites having gravelly or sandy soils.
- Leaving debris behind saves the cost of removal, but it may also increase short-term fire risk.

The study, Effects of logging debris treatments on five-year development of competing vegetation and planted Douglas-fir, appears

in the recent issue of the *Canadian Journal of Forest Research*. The article is coauthored by Harrington and Schoenholtz. Harrington is a research forester at the Forest Service's Pacific Northwest Research Station, USDA Forest Service. He is based in Olympia, Washington. Schoenholtz is a professor in the College of Natural Resources at Virginia Tech, Blacksburg, Virginia.

More information: Read about Harrington and Schoenholtz's study in the *Canadian Journal of Forest Research* --
[pubs.nrc-cnrc.gc.ca/rp-ps/jour ... ode=cjfr?l=eng](https://pubs.nrc-cnrc.gc.ca/rp-ps/jour...ode=cjfr?l=eng)

Provided by USDA Forest Service

Citation: Study reveals that logging debris suppresses development of an invasive competitor, Scotch broom (2010, April 2) retrieved 20 April 2024 from
<https://phys.org/news/2010-04-reveals-debris-suppresses-invasive-competitor.html>

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