

Wildfire and Water Repellent Soils

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One common physical change to forest soils after wildfires is water repellency. Water repellent soils have a limited ability to retain or absorb water, which can result in increased erosion, altered substrate water recharge and quicker stream flow delivery with the increased potential for flooding. Wildfires create water repellent layers by partially volatilizing organic compounds in the soil that then condense onto cooler soil particles and form a waxy layer. Water repellent soils are most often seen after moderate to severe fires and tend to be more common on dry, sandy soils and least severe on wet, fine textured soils. Generally, water repellency weakens with each rainfall and does not persist for longer than two to four years after a burn.

To check for water repellent soil, scrape away the ash layer to expose the soil. Place one drop of water on the soil surface. If water droplets bead on the surface for 10 to 40 seconds, it is considered moderately water repellent. If it beads for more than 40 seconds, it is considered strongly water repellent.

Sometimes, the water repellent layer is a few inches under the soil surface. In these cases, scrape away a one-half to 1 inch of soil and repeat the test to find the upper boundary of the water repellent layer. Continue testing the soil by scraping away additional layers of soil, one-half to 1 inch at a time, until non-water repellent soil is reached. This will give you the location and depth of water repellent layers.



To treat water repellent layers:

- Fallen logs can be placed across slopes to slow runoff and intercept sediment.
- Hand rakes or hoes can be used on gentle to moderate slopes to break up repellent layers and allow water to infiltrate.
- On steeper slopes, scatter straw mulch to protect soil from erosion.
- Use seeding, straw bale check dams, silt fences and other practices that control erosion and reduce runoff.

For more information on erosion control, contact your local County Extension Office or Natural Resources Conservation Office.

For more information on water repellent soils go to: <http://www.cnr.uidaho.edu/extforest/AftertheBurnFINAL.pdf> and go to page 67.