



# Recovering After the Fire

## EROSION CONTROL

*Jennifer Hinkhouse*

Most landowners in the West have unfortunately become very familiar with wildfires.

Fire can cause more than just a burn area; it can also cause erosion, decreased water quality, and a lack of vegetation to support wildlife and livestock. Landowners are often left wondering where to begin after a large wildfire and how to make the right choices for their properties and their budgets.

Preventing soil loss from erosion is one of the most effective post-fire areas to start with. Lack of vegetation on the ground can make runoff occur rapidly, causing a decline in water quality, loss of topsoil, and erosion. Runoff potential can increase by as much as 30 percent the first year after a fire.

What causes erosion to increase post-fire?

Increased runoff causes erosion, but what causes the increased runoff? Knowing the factors that increase run-off post-fire can help reduce erosion. Three of these factors are increased soil compaction, lack of

vegetation to slow water movement, and hydrophobic soils

With the lack of both vegetation and debris on the area, soil compaction from water can occur. A raindrop falling onto a healthy forest is slowed by the tree canopy and again by any vegetation on the forest floor and finally by ground debris. Without a canopy or vegetation, a rain drop hits the ground at an estimated 20 miles per hour, which compacts soil and causes less water infiltration.

Vegetation also plays a key role in infiltration of water into the soil. Slowing the water down allows more time for water to percolate into the soil. These plants also help slow erosion by stabilizing soil with their roots.

Fire can create hydrophobic soils. These soils form when organic material is burnt creating hydrocarbon residue. The hydrocarbon soaks into empty pore spaces in the soil making it impervious to water. Hydrophobic soils decrease infiltration of water and increase runoff and erosion.

Minimizing erosion post-fire is critical to rehabilitation of the area and water quality. There are many techniques available to landowners, and most can be achieved using items already on hand.

### Reseeding

Many plants will reestablish depending upon the fire severity; however, in areas with high-intensity fires, plants may not come back as readily. Seeds stored in the soil can

be sterilized resulting in isolated areas where reseeding is necessary. Leaving any remaining vegetation is important (but trees that are hazards to personal safety or structures should be removed). Next, choose an appropriate seed mix. The type of seed is selected based on how quickly it germinates and produces a fibrous root system. For help in selecting appropriate seed mix for your location, contact your local Natural Resources Conservation Service office or local University of Wyoming Extension office. Once a seed mix is selected, reseed the area with the use of a broadcast seeder or similar device. Follow up with weed control and mulching to ensure best results.

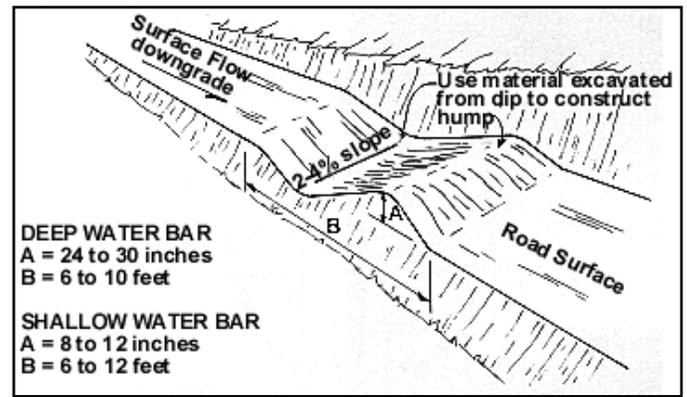
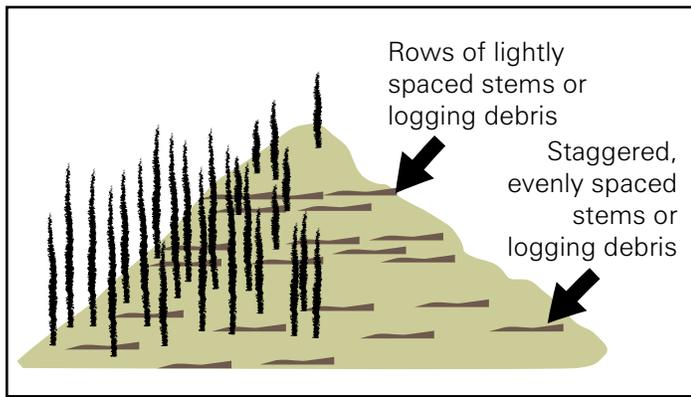
### Mulching

Mulching can be very effective post-fire to control erosion and help establish new vegetation. This is typically done to high risk areas (such as steep slopes near structures) as mulching can be costly. When used in combination with reseeding, mulch provides protective cover and creates a suitable environment for seed germination.

There are several types of mulch available. In an area where trees are being cut down, tree material can be chipped or masticated to provide mulching benefits.

Straw is also an option for mulch, but using certified weed-free straw is very important to avoid spreading noxious weeds. Straw should be applied





at a depth of 2 to 3 inches and cover approximately 30 percent of the soil. A technique known as crimping can be used to prevent straw from blowing away. Crimping involves working across the slope of the area and pushing the straw into the soil with a spade. Crimping should be done every foot and material pushed into the soil at a depth of 4 inches. Plastic netting can hold mulch in place, although it can be costly.

### Contour Log terraces

Log terraces are an effective way to slow erosion while using post-fire material. Dead trees are cut, limbed, and placed across the slope of the hill. Ensuring complete contact between the log and ground is important. Backfilling against the log to decrease the chances of erosion under the log may be necessary. On the steeper areas, logs should be closely spaced. This will help hold soil and slow the movement of water. Logs are placed in an alternating pattern, further downhill, to ensure water meanders as it moves down the slope, which slows water movement and decreases erosion. In steep areas, logs can be bedded down in the soil or reinforced with stakes on the downhill side.

### Straw Wattles

Wattles can be used much like contour log terraces. Netting material is filled with straw, excelsior, wood chips, or other material. Wattles are installed across the slope to slow water movement and minimize erosion. These devices have the added benefit of being flexible, making them ideal for use in drainages and on uneven terrain.

### Silt Fences

Silt fence is typically seen near construction projects because this method is most effective in areas where runoff is distributed over a broad, flat area. When runoff hits the silt fence, water passes through and the fence captures all of the soil and

debris. These structures are made from a combination of fabric filter cloth and woven wire and require maintenance to stay effective.

### Water bars

Water bars move water off of areas such as roads to streams, culverts, or vegetated areas. These structures are berms of soil or bedded logs that divert water off the area to avoid creating gullies. They must be angled downslope towards the desired area where water is to be distributed. Spacing of water bars is determined based on the grade of the area and soil type.

### Additional information

For more information on how to install soil erosion control practices and other methods, visit the U.S. Department of Agriculture Natural Resources Conservation Service and Wyoming NRCS Wildfire Recovery website:

- <http://bit.ly/preventerosion>
- <http://bit.ly/wildfirepubs>

Or the Wyoming State Forestry Division's Forestry Best Management Practices:

- <http://bit.ly/bestmanage>

Other post-fire information can be found in our "Living with Wildfire in Wyoming" publication at

- <http://bit.ly/1wildfirewyoming>

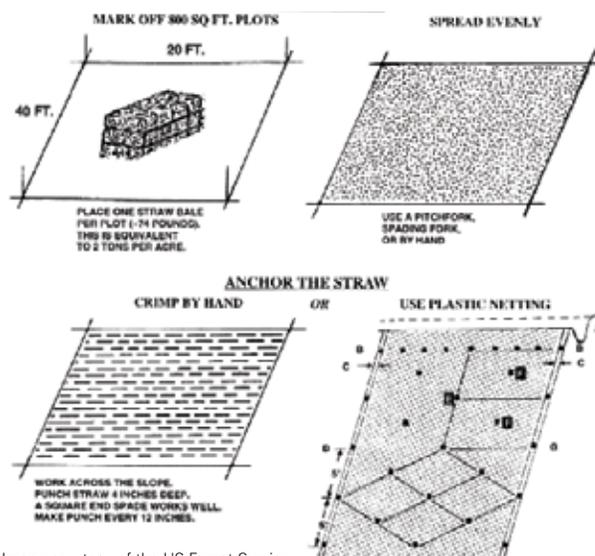


Image courtesy of the US Forest Service

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