

Still have questions? Do you want to arrange a site visit? Please call us!

If you don't know where to start or you have general questions call:

Garry Sanfaçon | Fourmile Canyon Fire Recovery Manager |
Boulder County Commissioners' Office
gsanfacon@bouldercounty.org | 720.564.2642 |
www.bouldercounty.org/fourmilefire

If you have questions about trees and forest stewardship call:

Allen Owen | District Forester |
Colorado State Forest Service
allen.owen@colostate.edu | 303.823.5774 |
www.colostate.edu

Ryan Ludlow | Outreach Forester |
Boulder County Land Use
rludlow@bouldercounty.org | 720.564.2641

If you have questions about ordering seedling trees call:

Nancy McIntyre | District Manager |
Boulder Valley & Longmont Conservation Districts
nmcintyre@bouldercounty.org | 303.776.4034 x3

If you have questions about erosion control or reseeding call:

Boyd Byelich | District Conservationist |
Natural Resource Conservation Services
boyd.byelich@co.usda.gov | 303.776.4034 x3 |

If you have questions about noxious weeds call:

Steve Sauer | Weed Coordinator |
Boulder County Parks & Open Space
ssauer@bouldercounty.org | 303.678.6110

Sharon Bokan | Small Acreage Coordinator |
CSU Extension/Boulder County
sbokan@bouldercounty.org | 303.678.6176.

If you have questions about the publicly funded Emergency Watershed Protection treatments including aerial mulching and seeding call:

Jennifer Kesler | Plant Ecologist for aerial mulching |
Boulder County Parks & Open Space
jkesler@bouldercounty.org | 303.678.6217

Erica Christensen |
Plant Ecologist & Volunteer Coordinator for seeding |
Boulder County Parks & Open Space |
echristensen@bouldercounty.org | 303.678.6329

If you have questions about USDA Forest Service owned land call:

Eric Schroder | Soil Scientist | US Forest Service
eschroder@fs.fed.us | 303.541.2538 | www.fs.fed.us

If you have questions about Bureau of Land Management (BLM) owned land call:

John Smeins | Hydrologist | Bureau of Land Management
jsmeins@blm.gov | 719.269.8581 | www.blm.gov

Land Rehabilitation FAQs

This list of frequently asked questions was prepared by the Fourmile Fire Rehabilitation Outreach Team as a “how to” guide to help property owners find answers to questions about treating land that was directly impacted by the fire or that sits adjacent to or downstream from the burn area. The information primarily addresses private land ownership, but also includes an overview of watershed-level erosion control treatments planned for the most vulnerable areas affected by the fire.

This document will be updated frequently. Please check for the latest edition online at www.bouldercounty.org/fourmilefire. Also, you may find that many of the website addresses and document links included in this publication are more easily attained through the online version of the guide.

Who is the Rehabilitation Outreach Team?

We are an interagency team of natural resource specialists from Boulder County, Natural Resources Conservation Service (NRCS), Colorado State Forest Service (CSFS), U.S. Forest Service (USFS), Boulder Valley and Longmont Conservation Districts, and Colorado State University (CSU) Extension.

What is the Rehabilitation Outreach Team's mission?

To provide education and outreach to landowners about actions you can take to help your land recover from the fire. We want to provide you with the tools, techniques and knowledge needed to protect your land from post-fire degradation and to protect the community against loss of life, property, and shared resources on a watershed level.

How can our team assist you?

Our team is available to help answer questions about land rehabilitation by phone or email. We are also available to set up a time to visit your land and help you assess what actions can be taken on your land to reduce post-fire degradation.

Our contact information is included at the end of this document. Please give us a call. We are here to help!



Land Rehabilitation FAQs by Topic

Trees and Forest Stewardship

Do I need to cut down all the trees on my property?

No. There is no need to cut down all fire-damaged trees on your land, only the ones that pose a hazard to people, animals, personal property, utilities, and other structures that might be injured from falling trees. Ecologically, it is appropriate to leave dead burned trees standing on your land, as their presence is benign unless they pose a hazard by falling down.

When cutting dead trees, you should try to limit soil disturbance and the number of vehicular trips across your land. This will help to minimize post-fire erosion and the potential for noxious weed introduction to the disturbed soil. Also, be sure to take note of the safety instructions included in the next paragraph.

Are fire-killed trees a falling hazard?

They can be. After the fire, you should focus on removing severely burnt trees along roads, driveways, near your home site, and in areas where you spend a lot of time. Fire-killed or partially-burned trees are at high risk for falling unexpectedly. Stay out of the forest when there are strong winds or if a precipitation event has made the soil very wet. You are encouraged to not cut larger-sized burned trees on your own. Burned trees are significantly more dangerous to cut due to their compromised stability and potential for limbs higher up in the tree to fall unexpectedly.

It is recommended that property owners and affected communities as a whole look to hire bonded and insured contractors who have extensive experience in safely cutting hazardous burned trees. In the years following the fire, many of the trees will begin to fall on their own as roots, trunks and limbs decay. Landowners should continue to be aware of these hazards.

Please visit www.bouldercounty.org/fourmilefire for a list of forestry contractors provided by the Colorado State Forest Service.



How can I tell if my trees are dead or alive? What should I do about the burned trees on my land?

If the trees do not pose an immediate falling hazard, you can monitor the trees over the winter and into the spring to see which trees survive. Not all burned trees will die. Ponderosa pines, for example, are a fire-adapted species. If a tree has any green needles left on its branches, it has a chance for survival. The tree can be monitored to see if needles resprout or if the tree grows new buds and branches in the spring. If a tree is a blackened stick with no needles remaining, the tree is dead and can be removed.

What do I do with burned trees I've cut down?

We recommend that you not take all cut-tree material off-site; often trees are more valuable left on-site than when hauled away. Consider first if the tree can be salvaged for something useful on-site. One of the best uses for dead trees is to chip them and broadcast the chips back onto the burned land for erosion control (see page 5 for additional information about chip mulching treatment guidelines). Some trees can be left standing for use as wildlife snags (i.e., dead trees=homes for birds and other animals). Others may be used as a cross slope erosion barrier to help stabilize soils in some situations (see page 6 for contour log felling treatment guidelines).

What are my options if I'm not in a currently defined treatment area or I'm right next to one?

If you are not currently in the defined treatment area, you can choose to implement fire rehabilitation on your property yourself at your cost. Our outreach team is available to provide technical assistance by visiting your property and giving you recommendations on treatments you can install yourself. Our inter-agency team will also be sponsoring workshops in the spring to show how to install these treatments yourself.

If you are next to a treatment area but not in it and have questions about it, you can contact Boulder County staff with your questions: for seeding, contact Erica Christensen at echristensen@bouldercounty.org, 303.678.6329, for aerial mulching, contact Jennifer Kesler at jkesler@bouldercounty.org, 303.678.6217.

If my property does not fall in either the reseeding or mulching areas, how do I get help to reseed or mulch? Can I participate in the mulching by helicopter if I pay for it?

Due to the complex nature of the aerial mulching contracts, landowners will not be able to participate in the aerial mulching by paying for it themselves.

For additional information on erosion control practices, please visit www.bouldercounty.org/fourmilefire and click on the link to more information for **erosion control practices**.

Boyd Byelich of the Natural Resources Conservation Service at boyd.byelich@co.usda.gov or 303.776.4034 x3 can also provide advice on erosion control practices for privately owned land.

Outreach Event Schedule:

Will there be follow up meetings and workshops?

Yes, we are planning to have follow-up meetings and will post those dates, times and locations on the County's Fourmile Canyon Fire website: www.bouldercounty.org/fourmilefire.

Would you like to receive regular email updates about Fire Recovery efforts?

Each of the four impacted fire protection districts have created an email distribution list to help residents stay connected on all issues related to the fire.

To sign up for your local email distribution list, please email the following community contacts with your name, address and phone number.

- To join the Four Mile list, email: Tara Kimbrough at tara.kimbrough.emt@gmail.com
- To join the Gold Hill list, email: Amy Hardy at ahardy105@yahoo.com
- To join the Sugar Loaf list, email: Cindy Hunter at cindy@fawnbrookgroup.com
- To join the Sunshine list, email: Johanna Hurley at SFPDcomm@gmail.com

What types of large-scale post-fire rehabilitation treatments will the public funds pay for?

The primary work to mitigate these threats involve aerial straw mulching over 1,800 acres on both private and public lands using contracted helicopters. There will also be seeding along roadsides to reduce the risk of noxious weed colonization in the area. Boulder County will partner with volunteers and the fire protection districts to plant seed.



How do I find out if my property is going to be treated with aerial mulching or seeding?

Boulder County is creating an online mapping application that will allow you to check and see if your property is located within the proposed treatment boundary for mulching and/or seeding. This mapping program will be added to the Boulder County website when it is available: <http://maps.bouldercounty.org/gisapps/erosiontreatmentviewer>. Note: you will need to install Microsoft Silverlight www.microsoft.com/silverlight to use this mapping application.

If the website link doesn't work please contact Erica Christensen, Boulder County Parks and Open Space at christensen@bouldercounty.org or 303-678-6329.

How much funding has been secured for these treatments?

In total, nearly, \$2.8 million in funding has already been secured to pay for these rehabilitation efforts. To read the complete Fourmile Emergency Stabilization Report and to find out more information about erosion control practices, visit: www.bouldercounty.org/fourmilefire.

What is an Emergency Watershed Protection Waiver? Does everyone in the burned area have to sign one?

Nearly, 66% of the land burned in the fire was on private property intermixed with public land. In order to implement the emergency stabilization treatments on private property, we need every landowner's permission to do so. We are asking all landowners in the burn perimeter to please sign an Emergency Watershed Protection Waiver (EWP). It is critical that we receive EWP waivers from all landowners in order for erosion control measures to have a chance to be successful.

Additionally, we are asking for signatures from everyone in the burned area, even if your parcel falls outside of treatment polygons. The treatment polygons are subject to change as our team continues to field check treatment boundaries and your parcel may be added to a treatment. Also, natural resource experts may need access across your land to treat neighboring parcels. Erosion control barriers, sediment traps, sand bags and debris catchers may need to be installed in gulches and around infrastructure that fall outside treatment polygons. Lastly, if flooding and debris flows occur Boulder County Transportation will need immediate access to impacted land to clean culverts of debris, repair damaged roads and/or remove sediment.

Where do I get an Emergency Watershed Protection Waiver?

You can download the release waiver online by visiting: www.bouldercounty.org/fourmilefire and scanning the page for the form or by typing in the words "landowners permission form" in the main search box at the top right of the web page. You may also contact the Natural Resources Conservation Service at boyd.byelich@co.usda.gov or 303.776.4034 x3.

Do I need to replant trees and when do I need to replant?

To plant or not to replant? Either way, the best time to plant is in the spring. The worst time is in the summer. Seedling trees come from a perfect greenhouse environment where their every need is met. Transporting those fragile seedlings to a patch of burned land and expecting them to take hold can be futile if extra care is not taken to acclimate them to their new home. Good planting techniques, such as establishing proper root zone contact (no large air pockets in the root zone) and keeping roots straight in the ground (roots extending fully downward), in addition to mulching, creating weed barriers, and providing frequent small volume watering will provide the very best chances for survival.

As you're replanting, keep in mind that western Boulder County lower elevation forests, known as the lower and upper montane life zones, were historically up to 25% treeless covered land. At best, they were a mosaic of largely discontinuous forest cover, meadows, large open grassy slopes (particularly south facing), and a mix of shrubs, forbs, and grasses and very few trees per acre. The trees existed in aggregated uneven-aged clumps of trees with very few trees per acre. The forest conditions that currently exist in much of the Front Range are the continuous, unhealthy high-density stands that need to be thinned. In the areas burned by the Fourmile Canyon Fire, the community has an opportunity to replant the forest with a focus on returning our forests to a healthy, fire resistant, and sustainable ponderosa pine ecosystem with significantly fewer trees per acre.

Replanting may be planted in a place where they are most appropriately done by focusing on planting in clumps of 5-12 trees with spacing between trees being 2-8 feet apart, and distances between clumps of 100 to 150 feet apart.

Seedlings ought to be easily watered and maintained, as the burned area is a very inhospitable place for seedling survival. Additionally, in an attempt to not re-create the problem, you should plant native trees in a spatial arrangement (see above) that can effectively break-up the fuels for potential future fires, but also provide for visual and audio screening for privacy. Always keep in mind that the seedlings you plant today will be the future forest in 50 to 100 years. We do not want to plant a new sea of green that is susceptible to another large fire.

Where can I purchase seedling trees?

Both the Boulder Valley and Longmont Conservation Districts sponsor a seedling tree program each year. The objective of the program is to provide low cost seedlings to landowners who have two or more acres. The Colorado State Forest Service at the CSU Foothills Campus grows the seedlings.



The following species are generally offered:

- 10" to 30" bare root deciduous shrubs and trees canes, including species such as chokecherry, native plum, and wild roses, or 5" to 12" top height bare root conifers including Ponderosa Pine. The bare root seedlings sell for \$44 for 50 seedlings.
- Potted trees of 5" to 12" top height in 2" x 2" square pots. Includes species of Rocky Mountain Juniper, Douglas fir, and Ponderosa Pine. Sell for \$56 for 30 seedlings.
- Smaller potted seedlings (are 3" to 6" in top height) in a 1" round tube. These seedlings sell for \$36 per 30 seedlings and include many of the same species as the regular potted.

Most seedlings are being offered to Fourmile Fire impacted landowners at a discounted rate.

To order seedlings, contact Nancy McIntyre at the Conservation District Office at 303.776.4034 x3 for an order form. A seedling description and picture of each species is available at: <http://csfs.colostate.edu> (search for "seedling purchase" in the top right search box). The last date to order seedlings is March 21, 2011. Seedlings will be available for pick-up at the Exhibit Building at the Boulder County Fairgrounds on Friday, April 8, from 8 a.m. to 5 p.m., and on Saturday, April 9, from 8 a.m. to 11 a.m.

What species of trees should I plant? What is the best way to plant seedlings?

If you are interested in purchasing seedlings but don't know which would be best for your property, we are tentatively holding a planning and planting workshop from 6-9 p.m. on Thursday, Jan. 20, in Longmont. Representatives from the Colorado State Forest Service, the State Forest Service Nursery, Natural Resources Conservation Service and CSU Extension will be available to assist you with the seedling planning, planting and care. To find out more information about this planting workshop and to confirm the date and time, call Nancy McIntyre at the Conservation District Office at 303.776.4034 x 3.

Are my partially-burned trees at risk from attack by bark beetles?

Yes, unfortunately trees that survived the fire are now highly susceptible to bark beetle attack. After a fire, there is a tremendous amount of chemicals (phenols and turpines) released into the air by the weakened trees. Bark beetles can "smell" the chemicals that these weakened trees are producing and they will begin attacking trees within the fire perimeter. The most damaging bark beetles to be concerned about are Douglas-fir bark beetles, IPS bark beetles, and to a slightly lesser extent, mountain pine beetles. For more information about bark beetles, contact Ryan Ludlow, outreach forester with Boulder County at 720.564.2641.

How do I put a value on trees I've lost?

First, you need to check your homeowner's policy to see if it includes a monetary cap on tree damage per tree or per property. The Internal Revenue Service (IRS) also has a cap on the amount you can deduct for losses. Please refer to the IRS website www.irs.gov or your tax preparer for this information.

Most insurance companies only cover the loss of trees and specialty items (i.e. sculptures) in a landscape, not grasses and shrubs. There are three different methods used to evaluate the value of trees in a landscape. You can hire a professional tree appraiser (there is a certification program to appraise trees, (<http://secure.isa-arbor.com>) to give you an estimate. Also, the following websites describe and provide the formulas for estimating your tree loss.

- www.ianrpubs.unl.edu/epublic/pages/publicationD.jsp?publicationId=91
- <http://extension.usu.edu/htm/publications/publication=6287>
- www.ksre.ksu.edu/library/hort2/mf632.pdf

How do I find a forestry or landscaping contractor?

The Colorado State Forest Service has a list of forestry contractors which they've provided on the Boulder County website at: www.bouldercounty.org/fourmilefire. The contractors list is also available in hard copy at the Boulder County Land Use Office, 13th and Spruce Streets, in downtown Boulder.

Contractors for landscaping, roadwork and other work can be found through these organizations:

- *Associated Landscape Contractors of Colorado*: <https://alcc.com>
- *Colorado Contractors Association (roads)*: www.coloradocontractors.org/index.html
- *Better Business Bureau*: <http://denver.bbb.org>

I still have questions about my trees. Who do I call?

The Colorado State Forest Service is available to answer all of your forest stewardship questions. Their staff can be reached by calling 303.823.5774. You can also call Ryan Ludlow, outreach forester with Boulder County at 720.564.2641.

Noxious Weed Control

What do I need to do with the weeds?

Due to the timing of the fire, there is limited work that can be done until the weeds sprout in the spring and summer. If you had known infestations of noxious weeds prior to the fire, they will still be there next year. The fire in most cases did not burn hot enough to destroy the root systems or weed seeds. The weeds will take advantage of the situation and potentially spread farther or increase due to the lack of native vegetation.

For the weeds that we know are in the area or that we know are likely to increase in population, we have a management guide and other information that we can provide to landowners. You can also bring in plant samples to the CSU Extension office for identification and control recommendations. If you would like to speak to us about noxious weed management call Steve Sauer, Boulder County Weed Coordinator at 303.678.6110 or Sharon Bokan, CSU Extension, Small Acreage Coordinator at 303.678.6176.

The Extension Office is planning on having several weed management workshops in the area this summer. The workshops will not occur until the plants are actively growing so that we can properly identify them prior to management recommendations. The workshops will be advertised through the county website.

Erosion Control Treatments | Emergency Watershed Protection: Aerial Mulching and Seeding

What does it mean that a "Watershed Emergency" exists? What does Watershed Protection entail?

Back in October, the Fourmile Emergency Stabilization team researched and wrote a Fourmile Emergency Stabilization (FES) Report that identified a watershed emergency that must be addressed. The report indicated that more than just voluntary property-by-property treatments need to be deployed in order to minimize the potential for community-wide dangers, such as flooding, due to the disruption to the natural watershed drainage system as a result of the fire.

The team identified that the moderately and severely burned areas are at risk for flooding and debris flows. The FES team determined that one of the most complicating factors in the emergency stabilization revolves around the land ownership pattern within the fire perimeter. In order for soil stabilization to be effective, we must treat on a watershed scale regardless of property boundaries. The current aerial mulching polygon (landscape boundary) locations are based on burn severity, slope, and runoff potential.

As described in the FES report, additional information from property owners and/or field review may reveal a need to modify polygon boundaries. Please contact Jennifer Kesler, Boulder County Parks and Open Space at jkesler@bouldercounty.org or 303.678.6217 if you have any questions or comments regarding modification of mulching polygons.

If you would like to talk to someone directly about the FES team report you can call Boyd Byelich of the Natural Resources Conservation Service at boyd.byelich@co.usda.gov or 303.776.4034 x3.



When is the best time to reseed? What type of seed should I use and where do I get the seed?

Reseeding can be done from approximately mid-October to mid-April. The soil must be thawed enough to incorporate the seed into the soil with no snow on the ground. The problem with seeding in late fall and winter is the potential for high winds to blow the seed away. Springtime prior to spring snows and rain is a very good time to seed. Mulching after seeding can protect the seed from the wind and also maintain soil moisture for germination. Due to the timing of the fire, the reseeding effort for weed control will take place between March and April.

We have created a grass seeding mix (oats, squirreltail, slender wheatgrass and Sandberg bluegrass) that we recommend using if you decide to seed. This mix was chosen to provide quick cover competition for aggressive weeds. In addition, the mix includes native species that are not expected to persist beyond ten years, allowing local native species to re-establish later without competition from aggressive noxious weeds.

A description of the seed mix can be found on the Boulder County website: www.bouldercounty.org/fourmilefire. We are currently working with the area seed companies to make the suggested seed mix readily available. You can call Erica Christensen, Boulder County Parks and Open Space at 303.678.6329 if you have additional questions about seeding.

Here are some local seed retailers that have agreed to carry the recommended seed mix:

Arkansas Valley Seed Solutions
4333 Highway 66
Longmont, CO 80504
970.535.4481
www.avseeds.com

Pawnee Buttes Seed, Inc.
P.O. Box 100
605 25th Street
Greeley, CO 80632
800.782.5947
www.pawneebutteseed.com

Sharp Brothers Seed Company
101 E. 4th Street
Greeley, CO 80631
970.356.4710
www.sharpseed.com

What techniques will give my seeding the best chance for success?

One of the keys to successful reseeding is good seed. It is important to obtain your seed from a reputable seed company. They can provide you with the test information for the lots used to make the mix, which is important to know that you are buying quality seed. Always purchase seed on a pure live seed (PLS) basis. Pure live seed tells you how many seeds per pound of seed are viable and will germinate. No seed lot is without a few weed seeds in it, but you should strive for the best seed mix possible. Also, not all problematic weeds, like cheatgrass, are considered noxious weeds, but you want to make sure to avoid them. Always ask if there is cheatgrass in the seed, and do not purchase any seed with cheatgrass in it.

The next key for success is good seed to soil contact. You will want to broadcast (by hand or with a spreader) about 50 seeds in a square foot (you can count out 50 seeds and spread it over a measured square foot area to calibrate your eye). Once the seed has been spread, lightly rake the seed into the soil parallel with the land contour. Raking perpendicular to the contour (down the slope) will only add to erosion problems. The seed needs to be between ¼ to ½" in depth. Raking the seed in deeper than ½" will prevent the seed from germinating and emerging. You will still be able to see some seed at the soil surface and this is not a problem. Mulching after seeding is recommended to hold the soil and seed in place and retain soil moisture for germination. Mulch should be 1" in depth.

I still have questions about erosion control. Who do I call?

The Natural Resources Conservation Service is available to answer all of your erosion control questions. Call 303.776.4034 x3.

Erosion Control

The importance of erosion control cannot be overemphasized. The destructive nature of a wildfire such as the Fourmile Canyon Fire stresses soils to the point where they can no longer contain or minimize runoff from rain and drainage water in the same way they did before the fire. If care is not taken to adequately stabilize and rehabilitate damaged soils, the risk of debris flows and flooding can endanger people and property within and around the burn area.

For the purpose of this guide, we will primarily address the strategies that individual property owners can take to rehabilitate the soils on their own lands. Understanding, however, that there exists a watershed level need to rehabilitate soils throughout the burn area, we have also included information about plans to publicly treat lands that are most at-risk for flooding and further erosion.

Erosion Control Treatments | Individual Properties

What treatments are recommended to help reduce erosion and runoff?

Mulching is one of the best treatment options available to help limit the amount of soil erosion and runoff after a fire. If your land is on relatively steep slopes (about 20-60% slope) and was moderately-to-severely burned by the fire (with a high amount of ground cover consumed), then it would probably be beneficial to apply mulch to your land.

Determining if your land needs to be mulched can be tricky and often depends on your individual site. Members of the Rehabilitation Outreach team are available to help you determine if it would be beneficial to apply mulch on your land. Call the Natural Resources Conservation Service at 303.776.4034 x 3 for help determining if your land would benefit from mulching.

What type of mulch should I use and what is the best way to apply it?

The two mulch types that are commonly available in our area are certified weed-free straw mulch and wood chips. Each type has its advantages and disadvantages.

Certified weed-free straw mulch is the easiest type of mulch to apply by hand and is very effective at reducing runoff. Its biggest downside is that it is light and can blow around in high winds. Straw mulch should be applied to a depth of one or two inches and ideally cover 70-80% of the ground.

Wood chip mulch can be created on-site by chipping burned dead trees. Chipping is often the best use of burned trees and has proven to be very effective in reducing erosion after a fire. After chipping is done with a machine chipper, you will



generally need to hand rake the chips to an even depth. It is critical that chips are spread evenly to a depth of no more than one inch and ideally cover 70-80% of the ground. If chips accumulate in deep piles, they will inhibit native plant re-growth, exacerbating erosion concerns. Wood chip mulch use can be self-limiting because many areas are inaccessible to chippers. Areas that chippers cannot access are good areas to apply straw mulch.

The U.S. Forest Service has placed small piles of wood chip mulch in four locations within the burn area. Wood chips can be picked for free at the intersection of Gold Hill Road and the Switzerland Trail and at three Fourmile Fire area fire stations (Salina station (burned down), Logan Mill station, and the Wall Street station). You will need to hand-load the material into your vehicle.

Another type of mulch that is effective at reducing erosion is a product called WoodStraw™ mulch. It is more expensive than other types of mulch and isn't available locally at retail outlets. However, it has less potential to introduce weeds and stays on the hillside better in wind. Visit the company's website, www.woodstrawmulch.com to find out more information.

When should mulch be applied?

Mulching should be completed by early spring 2011 before the rainy season starts. If possible, it is beneficial to apply straw mulch in the early spring right before a spring snowstorm. This helps bond the straw to the ground. Wood chip mulch and woodstraw™ can be applied at any time from now until the first big spring rains.

Where do I get certified weed free straw?

The Colorado Department of Agriculture publishes a certified weed free forage directory (it contains both hay and straw) available at www.colorado.gov/cs. The directory does not separate hay and straw producers so look for straw producers. Bales come in different sizes. For hand mulching, smaller bales are recommended. Larger bales require lifting equipment to move them. Local farmers might be able to deliver directly to your property if several people purchase a whole load together. Consider delivery to a central, easily accessed (both by you and the delivery equipment) location.

Why does mulch help reduce erosion?

Mulching is effective at reducing erosion after a fire because of its ability to reduce the impact of raindrops before they hit bare soil. Each time a raindrop impacts bare soil, it creates a micro-explosion of sorts that dislodges soil particles allowing them to move downhill. Mulch slows the incoming raindrops' velocity and also helps to slow the rain runoff as precipitation gains velocity and runs down slope. The first year after a fire, when native vegetation has not regrown, is the most likely time that major erosion will occur. Erosion will continue to be a concern in subsequent years, but will likely be the worst the first and second rainy season after a fire.



Does contour log felling or the use of straw wattles help reduce runoff?

Contour log felling and straw wattles have been a common post-fire erosion control technique for many years. Recent evaluation of their effectiveness, however, has led natural resource experts to begin moving away from their large-scale usage in fire rehabilitation. Our team does not believe the use of these erosion barriers is the most cost-effective way to control erosion on your land. Instead we would recommend mulching your hill slopes with certified weed-free straw mulch or wood chip mulch.

Contour log felling is very labor intensive to install and easy to do incorrectly. Research suggests that even when logs are installed perfectly, they only provide erosion control for the first couple rain events. Logs quickly fill with sediment during large rain events, after which, sediment simply flows over the top of the contour felled logs.

Contour log felling can be a good option if you are simply trying to utilize burned dead trees on site and should be combined with straw mulching. Putting logs on the hill slope contour aids in log decomposition. If you decide to use contour logs to help reduce erosion, please consult with us before installation to ensure you are installing the logs in a manner that will provide the greatest benefit. Call the Natural Resource Conservation Service at 303.776.4034 x 3.

Straw wattles (shown below) are easier to install than contour logs but recent research sees similar results as contour log felling. Straw wattles provide erosion control for the first couple rain events, but also quickly fill with sediment. A major advantage of straw wattles over contour logs is that they are easier to correctly place on the hillside and have fewer gaps where water can flow under the wattle.



Could runoff from burned hill slopes impact my private road or driveway?

Yes, in many locations throughout the burned area, private unpaved roads and driveways may be impacted by erosion or deposition of sediment or debris. Damage to the road surface, roadside ditches and/or cross drainage features may occur. Initial research in the burn area has identified increased potential for loss of access and threats to safety of road users.

How can I control erosion on my private road or driveway?

All of these methods are recommended as ways to improve drainage and erosion control on roads and driveways:

Improve Drainage on Unpaved Roads and Driveways

Improving and/or maintaining drainage on unpaved roads and driveways may lower the risk of erosion of the road surface and/or loss of access. Drainage practices that may be effective include: out-sloping, de-berming, installation or increasing frequency of rolling dips and water-bars, and culvert removal/upsizing/modification.

Storm Inspection and Response on Roads and Driveways

Keep culvert and drainage structures functional by cleaning sediment and debris from the inlet before storm events. Following a storm event, identify impacted roads culverts and respond by initiating a cleanup effort to remove accumulated sediment and debris from roadways, or repair/maintain damaged roads or road drainage features.

Channel Debris Clearing

Channel-debris clearing removes debris from the channel and flood-prone areas that could dislodge and plug culverts downstream. High priority areas for treatment would include areas in close proximity to houses and directly upstream from culverts. Debris may include burned wood from trees and debris from burned structures. Generally, this treatment would be done manually with a focus on small debris considered likely to be transported downstream.

Does reseeding help with erosion control?

Experience shows that seeding has become less popular as an erosion control treatment due to its limited effectiveness at providing an effective ground cover in the first year after a wildfire. In a review of existing post-fire seeding studies, few studies demonstrate statistically significant decreases in sediment movement. The major concern is that seedlings are just too small the first year to effectively hold soil in place and simply get washed off the hill slope during large rain events. Seeding has proven to help with erosion in the second and subsequent years after a fire, however by this time native vegetation has often reestablished on its own.



Do I need to reseed? When do I need to reseed?

In most cases, no, you won't need to reseed. Even in the most severely burned areas, research suggests that post-fire native grasses and flowers will reestablish on their own. Lessons learned from past Boulder County fires show that native vegetation is very well adapted to fire and will begin regrowth in the spring.

The only areas that we believe seeding could be beneficial are areas at risk for noxious weed infestation. Based on experience from recent nearby area fires, noxious weeds are expected to establish and expand in the burned area. Weed infestations are highly probable, particularly along roads and driveways and riparian areas, and in high to moderate burn intensity areas. Seeding may be beneficial in known noxious weed infestation areas and within 100 ft. of roads and driveways in the most severely burned areas.