

After the Fire: Reseeding and Revegetating Degraded Sites

Querencia in Action: Landowner Guide



About 1,000 miles of dozer lines were created during fire suppression efforts for the Hermit's Peak/Calf Canyon (HPCC) Fire in 2022. While these lines may be beneficial in the short term, they can create negative effects that landowners experience years after a fire has been extinguished. Dozers and heavy equipment compact the soil, and the removal of vegetation (i.e., fuels) leaves the conditions of disturbed sites hotter and drier, making it more difficult for many plants to re-establish. Additionally, dozer lines can cause wildlife habitat fragmentation and create opportunities for invasive plant species to establish in disturbed soils, creating long lasting changes to soil health and potentially alter plant communities over the long-term. In one study of a Montana grassland after a fire, exotic annual grasses established in bare disturbed areas, and outcompeted perennial native grasses. In addition, activities carried out after a wildfire – such as removing hazard trees near power lines, roads, and fences – can compact soil and disturb sites years after the fire. This document outlines simple, hand reseeding techniques to help limit weeds, encourage native plants, and control erosion.

Preseed Planning

Assessing a degraded site and its location is the first step in planning a reseeding project. Landowners should note the erosion potential and consider possible mitigation techniques. Is there any way to reduce the amount or speed of the water moving across the site? Erosion control practices (see: “An Introduction to Erosion Control”) can be combined with reseeding to accelerate recovery.

Landowners should also assess the surrounding ecosystem and soil properties by observing what plants are present in the surrounding area (e.g., grasses, wildflowers, shrubs), as they can indicate what seeds are likely to establish and thrive under local conditions. It is also important to observe the patterns, habitats and management practices of surrounding livestock, wildlife, and humans. Consider whether there are ways to reduce foot traffic from animals or humans that can worsen soil compaction and erosion, and whether measures such as fencing could help protect the site. Blocking off access to dozer lines may be especially important so they are not used opportunistically for recreation. When rehabilitating along power lines, consider keeping out trees along the right-of-way, and focus on wildflowers and grasses instead. This would reduce the risks of trees or branches falling on power lines and potentially igniting a fire. Power line corridors can provide excellent pollinator habitat and support wildlife.

Seeds can be collected or purchased from previous collections (see: “Sustainable and Ethical Seed Harvesting”) or from seed mixes. Figure 1 is an example of a seed mix used for restoring dozer lines following the HPCC Fire by Tooley’s Trees. When using a seed mix, utilize the “Good, Better, Best” guide to determine what you are able to seed within your constraints. Ideally, the mix should contain less than 0.6% weed seeds and no noxious weeds. Ask suppliers whether cheatgrass is in the



101 East 4th Street Road
Greeley, CO 80631
970.356.4710 Office
800.421.4234 Toll Free
970.356.1267 Fax
BuffaloBrandSeed.com
info@BuffaloBrandSeed.com

CUSTOM SEED MIX	SEEDS PER LB.	% of Mix
SAINFOIN	30,000.00	25.00%
FORAGE TRITICALE NA - SUB STERILE TRITICALE	13,000.00	20.00%
BARLEY- NA		
WINTER RYE SUB ANNUAL RYEGRASS	227,000.00	15.00%
ROCKY MTN PENSTEMON	600,000.00	1.00%
YARROW	2,770,000.00	0.50%
BLUE FLAX	290,000.00	1.50%
PURPLE PRAIRIE CLOVER	210,000.00	2.00%
WHITE PRAIRIE CLOVER	259,000.00	1.50%
ROCKY MTN BEEPLANT	65,900.00	3.00%
PRAIRIE CONEFLOWER	740,000.00	0.50%
ERYSIMUM- NOT AVAILABLE		
SANDY SOIL MIX		30.00%
- WESTERN WHEATGRASS 20%	110,000.00	
- THICKSPIKE WHEATGRASS 15%	154,000.00	
- SWITCHGRASS 15%	389,000.00	
- ANNUAL RYEGRASS 15%	227,000.00	
- SIDEOATS GRAMA 15%	159,200.00	
- LITTLE BLUESTEM 10%	260,000.00	
- SAND DROPSEED 5%	5,300,000.00	
- GREEN NEEDLEGRASS 5%	181,000.00	

\$7.50

Per Bulk Lb

Figure 1. Hermit's Peak/Calf Canyon seed mix formulated by Gordon Tooley.

seed mix. We strongly recommend not using any mixes with cheatgrass because it can aggressively dominate disturbed soils and outcompete native plants. Locally harvested seed can be mixed with purchased seed mix if there is not enough to fill in the area. Remember that it is better to have a variety of seeds that serve various functions rather than a large quantity of a single seed. The goal of restoration is to initiate a productive and diverse plant community that will help provide ground cover and stabilize the soil, not necessarily create an instant reproduction of previous plant communities. Restoring a previous plant community may not be possible after a major disturbance, and the short-term priority should be to focus on soil stabilization and creating good conditions that support a future vibrant plant community.



Tree hazard removal along the power line corridor created bare, compacted soil, lightly covered with masticated material.

Good, Better, Best Seed Guide

Good	Planting annuals is better than nothing, and annual seed is inexpensive and widely available. Annual grains used for livestock feed are a good, inexpensive option. Common non-native annuals that are found in most feed stores include wheat, barley and oats. While planting just annuals is a very short-term approach because they complete their life cycle within a single growing season, their quick growth establishment can stabilize soils soon after reseeding.
Better	Mixing annual with perennial seeds addresses the short-term need to cover bare soil quickly, while propagating for the following growing season. Perennials that are hardy, drought tolerant, and inexpensive include: Rocky Mountain penstemon, white prairie clover, and prairie coneflower. There are a few drawbacks and challenges to including perennial seeds in a seed mix. Annual-and-perennial seed mixes are generally more costly than annual-only mixes. Some perennial species devote their first few years to developing extensive root systems, making them more drought tolerant and resilient, but this also means you may not see much growth above ground during that time. Additionally, some species require freezing, wet, or cold conditions to break dormancy. However, the long-term benefits of including perennials in your seed mixes outweigh these challenges. Remember: native perennials take time and patience!
Best	Annuals, perennials, nitrogen fixers, pollinator plants, natives, and more that are site-adapted. Examples include seed mixes from Buffalo Brand Seed (Figure 1) and Curtis and Curtis Seeds (see Notes) that are specifically formulated for the HPCC burn scar. While these mixes may cost more initially, collective buying in bulk and/or collecting your own seeds over time can help.

Once a seed mix has been selected, determine the amount of seed needed for reseeding. Most seed suppliers can provide guidance on pounds of seed needed per acre, although this can vary depending on your seed mix. Consider the total area you need to reseed, your budget, and timing when developing a realistic timeline for your reseeding project.

Reseeding

Reseeding should happen as soon as the conditions are favorable. In New Mexico, the best time to reseed are before monsoon rains or before the first frost in the fall, ideally when soil is workable and before a rain event is expected. Weeding and preparing the site can

happen in any season. Before removing plants, figure out what plants are already growing so you can be sure you are only removing undesirable or invasive species.

Reseeding requires:

- Roughening up or scarifying the soil with a rake to create the right conditions and increase seed to soil contact.
- In the first year after a wildfire, hydrophobic (water-repellent) soils are a concern. Roughening the soil surface increases water infiltration.
- When raking the seeds in, rake along the contour instead of directly downhill. Raking downhill can increase erosion and channeling.

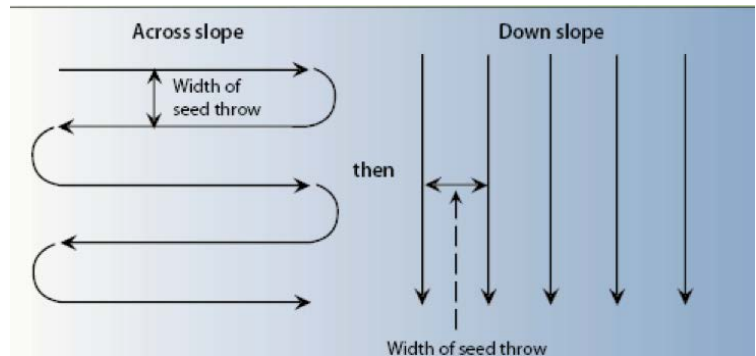


Figure 2. Reseeding directions for even distribution (Barkley, 2006).

To reseed an area, you will need to divide the seeds in half as you will be seeding in two different directions - across slope and down slope (Figure 2). Using a bucket with half of the seeds and a scooper (e.g., large yogurt or cottage cheese containers work great!), start at the top of the area and walk across the slope in a line and broadcast. A handheld or push broadcast spreader may be helpful for consistently covering large areas. As you spread, pay attention to the distribution of your seeds according to your throw and speed of walking. Try to stay even and consistent. When you get to the other side, step down a few feet and walk back across, again noticing the distribution of seed and adjusting according to the last seed line. Repeat until you reach the bottom of the area. Then repeat with the other half of the seeds but by walking up and down the slope from one side to the other. If it is too steep to broadcast seeds while walking upslope, only distribute when walking the downslope.

Then, rake the seeds in to a depth of 1/4" to 1/2", working both across and up the slope. Avoid raking downslope, as this can contribute to erosion and seed loss. Also, try not to pile up seeds when the rake stops.

Mulching is a great technique but can add more money and time. Depending on the project scale, decide on what you can afford. If you decide to use mulch, we recommend using local materials (e.g., pine needles, leaves, slash, etc.); mulch should cover seeds about 1"

deep. Finally, lightly tamp soil so the seeds touch the soil. Following seeding, check the site regularly to monitor sprouting success and continue to weed as the plants get established. Consider using starts or plugs in addition to reseeding, although these may require more water in the initial planting. See Barkley (2006) for more information on planting starts.

Reseeding a degraded site is an active restoration technique that requires an investment of time and money. A successful planting will promote a healthy ecosystem with more native plants, fewer invasive plants, and less erosion.

Landowner Resources		
Agency	Technical Assistance	Contact Details
New Mexico Forestry Division	Forest stewardship; wildfire risk; post-wildfire recovery; insect and disease identification; financial assistance	https://www.emnrd.nm.gov/sfd/contact-us/find-a-district-office/
Soil and Water Conservation Districts (SWCD)	Soil health; erosion control; water conservation; equipment rentals; financial assistance	https://www.nmacd.org/directories

Landowner Programs & Low-Cost Plant Materials		
Program	Description	Details
Conservation Seedling Program (CSP)	Low-cost seedlings for forest and watershed planting projects in NM, e.g., reforestation, wind protection, urban and community forestry, restoration, and cultural/traditional use.	https://www.emnrd.nm.gov/sfd/seedlings/
Landscape Stewardship Program (LSP)	Community plan for landowners in Sapello, San Miguel County, and Coyote Creek, Mora County (additional communities are expected to be included in future years). Provides technical assistance and recommendations to create management plans that address individual landowner objectives. This program allows District Foresters to apply and direct funding toward priority landscapes; landowners can choose to opt-in.	https://www.emnrd.nm.gov/sfd/stewardship/
Carbon Stewardship Program (CSP)	Provides direct payments to non-industrial private landowners for forestry practices that boost long-term carbon and forest resilience. Eligible practices include forest thinning, prescribed burning, site preparation, reforestation, and post-fire erosion control.	https://www.emnrd.nm.gov/sfd/forest-and-watershed-health-office/
Forest Health Initiative (FHI)	Cost-share program that reimburses non-industrial private landowners for up to 80% of the costs to treat forested land; focuses on forest thinning and slash treatment.	https://www.emnrd.nm.gov/sfd/forest-health/

Notes:

- No-till drills are sometimes used for larger seeding areas and can be rented through your local Soil & Water Conservation Districts.
- Renting with neighbors also cuts costs and the hauling of the equipment
- Curtis and Curtis Seed offers a “Hermit’s Peak Restoration Blend” and a “Land of Enchantment Mountain Blend”
<https://curtisseed.com/hermits-peak-restoration-blend/>
<https://curtisseed.com/land-of-enchantment-mountain-blend/>

Printable Plant Identification

Resources:

- New Mexico Thistle Identification Guide: https://nmfwri.org/wp-content/uploads/2020/07/NM_Thistles_screen_or_8.5x11_292016.pdf
- Troublesome Weeds of New Mexico (updated June 2020): <https://pubs.nmsu.edu/circulars/CR698.pdf>
- Visit the NMFWRRI website for:
 - Plant identification tools: <https://nmfwri.org/resources/new-mexico-plant-guides/>
 - Landowner guides: <https://nmfwri.org/stewardship/wildfire-resiliency/>

References

- Barkley, Y.C. (2006). After the burn: Assessing and managing your forestland after a wildfire. Station Bulletin No. 76. University of Idaho Extension: Idaho Forest, Wildlife and Range Experiment Station Moscow, Idaho.
- Environmental Monitoring and Assessment 99: 267–274, 2004.
- Nelson, J.K. (2008). Burned area emergency response plan vegetation resource assessment: Iron Complex (Buckhorn, Carey, Cedar, Eagle, Granite, Ironside, and Zeigler Fires).
- Quivira Coalition. An Introduction to Erosion Control. <https://quiviracoalition.org/product/erosion-control/>
- Robichaud, P.R., Beyers, J.L., and Neary, D.G. (2000). Evaluating the effectiveness of postfire rehabilitation treatments. USDA, FS Rocky Mountain Research Station General Technical Report [RMRS-GTR-63].
- Ross, C. (2004). Native seed collection and use in arid land reclamation: A low-tech approach.
- Tulganyam, S., and Carr, C. (2022). Short-term vegetation response to bulldozed fire lines in northern Great Plains grasslands. Fire, 5(3), 79. <https://doi.org/10.3390/fire5030079>

Credits

Written by Adrienne Rosenberg
Designed by Chris Romero



This guide was produced by New Mexico Forest & Watershed Restoration Institute (NMFWR I) in partnership with the Wildfire Resiliency Training Center, with funding from the USDA Natural Resource Conservation Service (NRCS), USDA NextGen, the Economic Development Administration (EDA) Disaster Recovery Grant Program and the Cooperative and International Programs of the U.S. Forest Service, Department of Agriculture, under the Southwest Forest Health and Wildfire Prevention Act. In accordance with Federal law and U.S. Department of Agriculture policy, NMFWR I, NMHU, WRTC and Luna Community College are prohibited from discriminating on the basis of race, color, national origin, sex (including gender identity and sexual orientation), religious creed, disability, age, political beliefs, and prohibits reprisal or retaliation for prior civil rights activity. NMHU and LCC are equal opportunity employers.

