

After the Fire: Post-fire Plant Communities

How Plants Return After the Burn

Querencia in Action: Landowner Guide



After a wildfire, many plants begin appearing across the landscape. Some are familiar and common around the area, while others, like the aromatic fetid goosefoot (*Dysphania graveolens*), are new to many. Some plants may have even survived a wildfire and begun growing again. Foresters use a concept called succession to predict what plants will grow after a disturbance. Succession is the idea that certain types of plants, or species with particular traits, will establish first, followed by other plants with different traits, in a somewhat predictable pattern. How a forest recovers is dependent on fire severity, elevation, climate, available plant material, and the different ways that plants re-establish after a major disturbance, like a wildfire. This document explores how plants reestablish after a fire and describes some of the most common plants observed within the 2022 Hermit's Peak / Calf Canyon (HPCC) burn scar.

Forest Types and Succession

The two forest types most impacted by the HPCC Fire are ponderosa pine and dry mixed conifer. According to tree ring records, ponderosa pine forests historically experienced low-severity and frequent fires, occurring every 2-26 years. In dry mixed conifer forest types, fires were less frequent, low severity, and occurring every 9-30 years. Low-severity fires are typically ground level fires that consume dry pine needles and grasses and help keep forest stands healthy by reducing fuel loads, recycling nutrients and encouraging tree seedlings to take root. Suppression and exclusion of naturally occurring fires from the landscape has caused a buildup of fuels for more than 100 years. Combined with hotter and drier conditions in the Southwest, these circumstances result in a volatile recipe for large catastrophic wildfires. One study found that the fire regime for the southern Sangre de Cristo Mountains dry conifer

forests was rarely the mixed- to high-severity forest fires that we see today. Unfortunately, the more severe a fire, the harder it is for the land to recover (Table 1). Ponderosas will have a harder time reestablishing at the lower, drier end of their elevational range and are more likely to successfully regrow in higher, wetter sites. (Figure 2).

Ponderosa pine and dry mixed conifer forests are fire-adapted ecosystems, meaning they have developed with fire as a natural part of the environment, and their plant communities can respond to wildfire in many different ways. Many plants grow best under specific conditions, such as certain elevations, slope directions, moisture levels, or exposure to wind. Habitat typing is a method used to identify and describe the different forest and woodland communities found in the Southwest. It groups sites based on the types of plants that naturally grow together under the same environmental conditions. These groups are called plant associations. Plant associations can help us understand how a site may change over time or respond to disturbances such as wildfire. By comparing a site to other locations with similar characteristics (with the same habitat type or plant association), we can use past observations from some sites to help predict future changes

Table 1. Fire severity classes and descriptions (Oregon State University Extension, n.d.)	
Low Severity	Most trees survive with scorch evidence. Most organic matter on soil surface is intact and little consumption or charring of twigs and down logs is evident.
Moderate Severity	Most trees have been killed or are severely scorched and retain most of their needles. Some organic matter on soil surface is consumed. Twigs may be consumed and downed logs are deeply charred.
High Severity	Nearly all trees are killed and have no needles. Nearly all organic matter, twigs, and logs have been consumed and soil may be damaged or altered.

Composite Burn Index

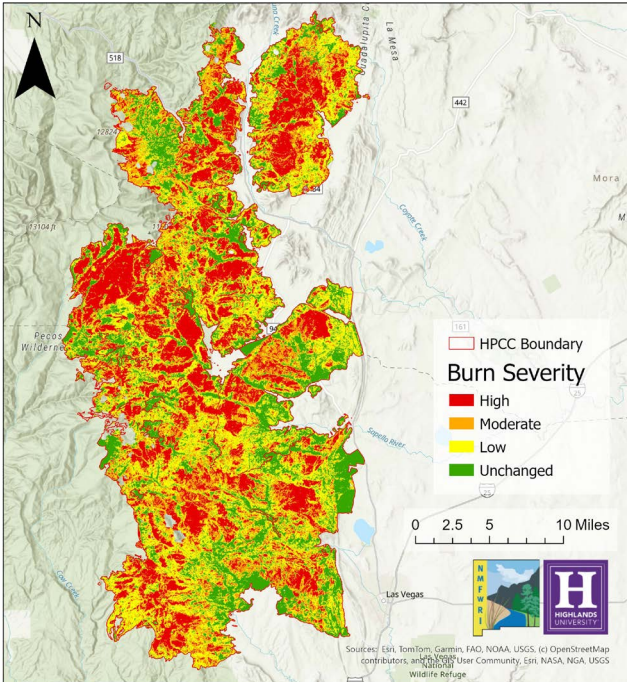


Figure 1. Composite Burn Index map for Hermit's Peak/Calf Canyon Fire (New Mexico Forest and Watershed Restoration Institute).

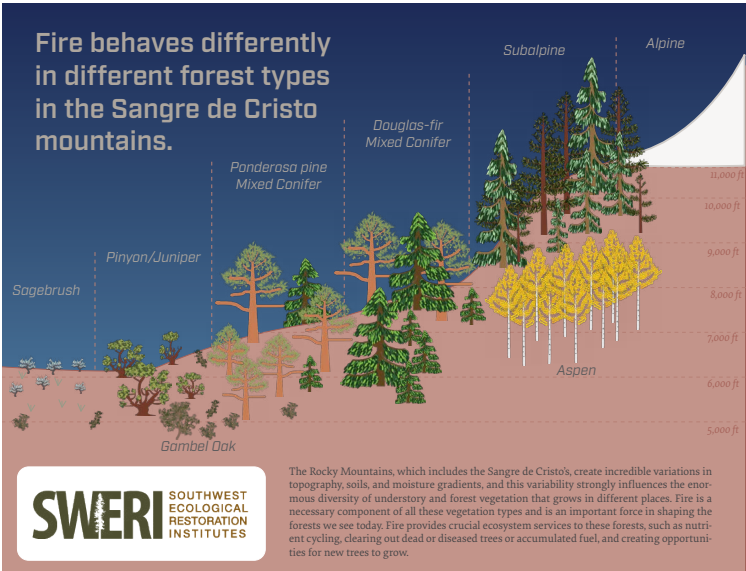


Figure 2. Southwest Ecological Restoration Institute forest type graphic by elevation (SWERI, 2026).

on others. For more information, see Plant Associations of New Mexico and Arizona, Volume 1: Forests (4th Edition) - https://www.fs.usda.gov/sites/nfs/files/r03/santafe/publication/Volume%201%20Forests%2024_July_2023_JY.pdf. RAVG (or Rapid Assessment of Vegetation Condition after Wildfire) can be a useful tool for forest succession projections but since on-the-ground verification may be limited, there may be differences between local observations and maps.

Table 2 (Pgs. 4-6) includes a number of plants that have regenerated within the HPCC burn scar. Interestingly, many of these plants are edible and medicinal.

Plant Community Reestablishment

Post-fire plant communities naturally reestablish by a) plants that survived the fire, b) plants that survived the fire belowground but need to regrow their stems and leaves, or c) dispersed seeds from surviving plants, seeds brought in by wind and animals, or seeds in the soil. Shrubs, grasses, and wildflowers can readily sprout from underground roots that vary in size, shape, and depth in the soil profile. Thick duff layers, i.e., organic matter on the soil surface, can burn slowly at high temperatures, and this heat and this heat can extend deep into the soil profile. Vegetation with deeper root structures are favored to survive in wildfires that damage soils.



Figure 3. Top left (clockwise): Chokecherries in bloom, chokecherry with ripe berries, closeup of chokecherry flower, fetid goosefoot.

Some shrubs can resprout from the root collar, i.e., the region where the trunk and roots meet, but if the collar is destroyed the plant will not survive. Rhizomes are horizontal underground stems (often mistaken for roots) that are deeper in the soil

profile and therefore more protected from lethal temperatures. Gambel oak and chokecherry (Figure 3) are two examples of plants with rhizomes. Gambel oaks are ready to sprout after a wildfire because their rhizomes are 4-20" deep in the soil. Many grasses and wildflowers can regenerate quickly after a wildfire and are typically the first plants to re-establish and stabilize the soil.

Several factors influence the successful dispersal of seeds into a burn scar. For ponderosa pine, the distance between the burn scar and the nearest surviving seed source is especially important because ponderosa seeds generally do not disperse very far from the parent tree. If a burn scar is located more than 150-300 feet from a surviving seed source, the probability of natural ponderosa regeneration decreases significantly. In this case, landowners should consider planting seedlings (see: Post-fire Reforestation). Many plants rely on wind or animals for seed dispersal, but successful regeneration may still depend on nearby seed sources and on animals moving through or inhabiting the burned area. Seed banks, or seeds that have been deposited in the soil over time, are another source for regeneration. If the fire was not hot enough to burn up the existing seed bank, it may be possible for seed germination. Some seeds wait in the soil until a disturbance produces the optimal conditions to thrive above ground while others need to be directly stimulated by the fire, such as those harder seeds like gooseberry, raspberry, currant, plum, and chokecherry seeds. Typically, seeds take longer to grow and need more energy to generate their root system, compared to plants with established root systems. Plants that reestablish or outright survive the fire take the least amount of energy and have the quickest access to water and nutrients.

Additionally, fire can change the site and community of plants by altering competition and number and type of plants. This dynamic favors early successional plants that thrive on bare ground, a flush of nutrients, and low shade/high sunlight conditions. These opportunistic plants, sometimes called "weeds," can be transported by machinery, cars, shoes, animals, and sometimes restoration seed mixes and mulches. Some weeds (e.g., cheatgrass) are very aggressive and can transform sites and their conditions, excluding other plants from establishing. See "Reseeding and Revegetating Degraded Sites" for more information about appropriate seed mixes and mulch.

Wildfires can be devastating to human and plant communities alike. Although recovery may seem out of reach, plants return to the landscape over time either naturally (through revegetation or seed regeneration) or with a helping hand. Thoughtful intervention can influence both the rate of recovery and the plant community that ultimately establishes post-fire.

"My strength is your strength. Stand tall with belief in your own resilience. You are part of this Earth that will always abide. Let any fears you hold become merely doors for you to step through. The memories held in my seeds will lead you forward."

– Mary Porter Kerns in Born of Fire (<https://onland.westernlandowners.org/2025/western-words/bornoffire/>)

Table 2. Common Post-Fire Plants in New Mexico					
Common Name	Species Name	Native	Found	Needs	Uses
Wild geranium, Cranesbill 	<i>Geranium richardsonii</i>	Yes	• Moist sandy, gravelly, loamy soils • Meadows, stream sides, openings • Piñon-juniper, ponderosa, spruce-fir, subalpine forests • Elevation 6,500-11,000 ft	• Moist soils • Coniferous forest or stream sides	• Powdered roots ingested and pulverized leaves to treat nosebleeds • Tea from leaves or roots can ease sore throat
American vetch, Wild sweet pea 	<i>Vicia americana</i>	Yes	• Gravelly, loam soils • Meadows, stream sides, road sides, trails, disturbed areas • Piñon-juniper, ponderosa, Douglas fir, spruce-fir forests • Elevation 7,000 – 11,000 ft	• Moist soils • Coniferous forest or stream sides	• Leaves used to soothe spider bites • Infusion used as an eyewash and in baths to ease sore muscles • Greens, seeds, peapods all edible • Animal fodder • Plants burnt and smoke given to horses to increase endurance
Golden banner, Golden pea 	<i>Thermopsis montana</i>	Yes	• Moist sandy, gravelly, clayey soils • Mountain meadows, open forests • Piñon-juniper, ponderosa-Douglas fir, spruce-fir forests • Annual • Elevation 6,200 – 11,200 ft	• Sunny, open site	• Used as an emetic • Used for headaches • Considered protection in warfare and other ceremonial uses • Edible seeds
Cota, Navajo tea 	<i>Thelesperma megapotamicum</i>	Yes	• Often disturbed sites, in sandy or clay-rich soils • Roadsides; prairies, desert grasslands and scrub, piñon-juniper woodlands • Perennial • Elevation 3,800 – 7,800 ft	• Good drainage	• Dried stems and flowers make excellent tea; other uses: http://naeb.brit.org/uses/species/3934/

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Purple prairie clover, Purple flower dalea 	<i>Dalea purpurea</i>	Yes	- Sandy, gravelly soils, drainages, roadsides - Desert grasslands and scrub - Piñon-juniper, ponderosa-oak woodlands - Perennial herb from a woody root crown - Elevation 4,200 – 7,600 ft	Grasslands	- Root chewed for its sweet flavor - Leaves used to make tea
Santa Fe phlox 	<i>Phlox nana</i>	Yes	- Sandy, gravelly, clay soils - Roadsides, disturbed areas - Desert grasslands and scrub; piñon-juniper, pine-oak transition forests - Perennial - Elevation 4,400 – 8,000 ft		
Scarlet bugler, Beard-lip penstemon 	<i>Penstemon barbatus</i>	Yes	- Dry, sandy, rocky hillsides of mesas and mountains and open pinon-juniper, ponderosa-oak, spruce-fir forests - Perennial - Elevation 4,000-10,000 ft	Hummingbirds and long-proboscis pollinators	- Taken for menstrual pain, stomachaches, coughs, to aid childbirth and as a diuretic. - Applied to burns
Orange sneezeweed 	<i>Hymenoxys hoopesii</i>	Yes	- Rich soils in coniferous forests, stream sides, mountain meadows: - Roadsides - Ponderosa, spruce-fir, aspen forests - Perennial - Elevation 7,000 – 11,000 ft		- A snuff of the crushed blossom used to treat hay fever and headaches - Used as an antiemetic - Roots used as chewing gum - Crushed flowers are boiled. with juniper ash to make a yellow dye
Western wheatgrass 	<i>Pascopyrum smithii</i>	Yes	- Dry flats and slopes, in both clayey and sandy soils - Perennial - Elevation 3,000 – 8,000 ft	Strongly rhizomatous	- Eaten as forage - Used to soak melon seeds to keep worms away and to make melons sweeter

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Fringed brome 	<i>Bromus ciliatus</i>	Yes	• Meadows, stream sides, forested areas • Perennial • Elevation 6,000 – 10,000 ft	• Poorly-drained soil (wet meadows and clay/loam)	• Used by the Iroquois as a corn planting medicine
Tufted hairgrass 	<i>Deschampsia cespitosa</i>	Yes	• Wet meadows, sand, gravel • Along rivers, streams, lakes • Perennial • Elevation 5,000 – 13,000 ft	• Prefers poorly drained soils, wet meadows	• Seeds edible • Good forage for sheep, elk, and cattle • Stabilizes disturbed sites
Blue grama, Grama grass 	<i>Bouteloua gracilis</i>	Yes	• Rangeland grass found from Canada to northern Mexico • Open rocky slopes, forest openings, grasslands • Perennial • Elevation 4,000 – 8,000 ft		• Roots chewed and applied to cuts • Taken as postpartum medicine • Seeds ground to make mush and flour • Stems used to make combs, brooms, baskets • Animal fodder
Smooth brome, Austrian brome 	<i>Bromus inermis</i>	No	• Riparian zones, valley bottoms, and dryland sites • Widely adapted • Disturbed sites • Distinguished by strongly rhizomatous habit and short awns • Cool season perennial • Elevation 6,000 – 10,000 ft	• Poorly-drained soil (wet meadows and clay/loam) • Sod-forming, highly competitive, allelopathic • Survives fire by sprouting from rhizomes, regenerates by tillering • Late spring fire can be used to control (when fire occurs at tiller elongation or heading, after tiller emergence) but may be only marginally effective	
Note: Table adapted from Weber (2022)					
Compiled by clinical herbalist, Erika Larsen, the plant uses included here are intended to showcase the role of these plants as food and/or medicine across several local cultures and traditions. The list is not exhaustive nor prescriptive. All plants should be confidently identified prior to consumption.					

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Credits

Written by Adrienne Rosenberg

Designed by Chris Romero



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