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Creosote Out

A Case Study of Grassland Restoration Near Deming, New Mexico

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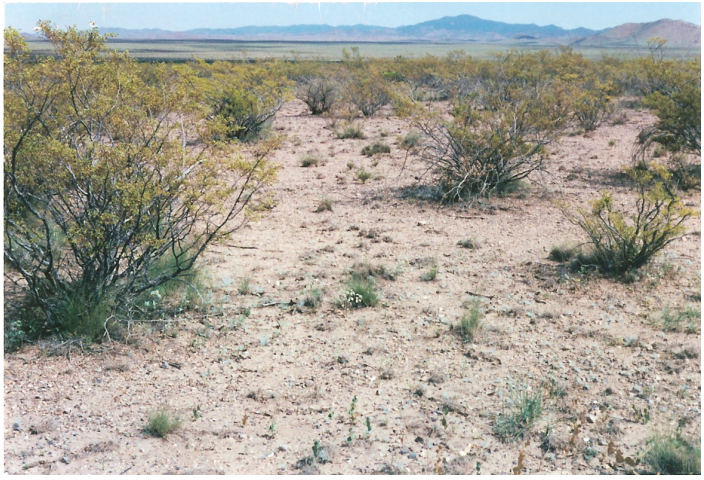
The Natural Resource Conservation Service (NRCS) is achieving success in grassland restoration at a site north of Deming, New Mexico. The area is showing signs of plant succession that hold the promise of more quality grass species as the soil and seed bed are developing.

Creosote is a native plant in the Chihuahuan desert of southern New Mexico, found in gravelly and hilly rangeland sites with shallow soils. Through the years, creosote has invaded into loamy and bottomland ecological sites in the Deming area - sites where creosote should not naturally exist. On some of these sites there are as many as 1,300 plants per acre, and this extremely dense population is severely detrimental to the native flora and fauna.

Invasive creosote stands, such as this, out-compete grasses and forbs for water and nutrients – thereby killing these more beneficial plants that provided food and cover for animal life. Grasses and forbs also more efficiently capture rain water, thus increasing infiltration rates. The leaves of grasses and forbs break the fall of raindrops, while creosote causes bare areas that are unprotected from rainfall that lifts the soil and causes sheet and gully erosion.

In the Deming area, sites that are dominated by creosote have virtually no herbaceous understory. Transects taken at the study site during the first year of treatment showed that the area had 70 percent bare ground, no herbaceous cover, 8 percent basal hits, and 10 percent litter. (Basal hits are encounters of



2001 photo of creosote with sparse herbaceous vegetation

2009 photo showing grassland recovery with increased herbaceous vegation

plant bases with the transect.) Since the creosote was defoliating, this may account for the high percent of litter.

It is not uncommon to walk through the Deming sites and find only sparse vegetation such as desert holly, three awn, and fluff grass. These species are low growing and small – offering no canopy, no cover, and almost no soil protection. Microbial activity in these areas is almost nonexistent, and insect presence is sparse. Except for a few jack rabbits, lizards, and evidence of kangaroo rats, there are almost no vertebrates.

The study area west of Cook's Peak was treated in 2001. NRCS monitored the grassland restoration site for eight years and found some very promising results.

Creosote kill was greater than 90 percent. Transect data revealed a conversion from virtually a monoculture of creosote with no herbaceous canopy to a very positive 38 percent canopy, 42 percent bare ground, 10 percent litter, and 10 percent basal hits. It is important to note that the Chihuahuan desert receives only 9-12 inches of annual precipitation and so plant succession occurs relatively slowly.

The herbaceous species in place consists of fluff grass, three awn, and six week grama. It is anticipated these pioneer plants will give way to more quality grass species as the soil and seed bed improves. Some of the sites throughout the county will be reseeded, because it is very possible that the natural seed bank has been depleted or lost due to microbial degradation or emergence of seedling that dried out due to bare ground exposure. This is particularly likely because some of these sites have had creosote infestations on them for at least 75 years.

NRCS staff has observed that with spring rains there has been blooms of forbs and life moving on the restoration sites. This is important because return of the microbial and insect activity is a harbinger of the breakdown of residue which is converted to humus that makes a better seed bed. Also, increased evidence of antelope and javelina suggests a more diverse and healthier environment.

For more information about the conservation of New Mexico's grasslands go to www.nm.nrcs.usda.gov