



MULE DEER AND THE EFFECTS OF FIRE

Fact Sheet #18

OVERVIEW

Fire can positively or negatively influence mule deer populations by creating habitats that encourage abundant growth of forbs, shrubs and grasses. Conversely in lower precipitation zones such as southwestern deserts, fire can destroy important vegetation which may be replaced by less desirable and invasive plants. Many other forms of habitat disturbance (properly managed silviculture, mechanical treatment) can create similar benefits, but fire in the right situation is a cost effective habitat management tool. Resource managers should appropriately use fire as a management technique to disturb summer and transitional ranges for the benefit of mule deer.

BACKGROUND

Fires are natural and essential in creating and maintaining mule deer habitats on many western landscapes. In most of their range, mule deer are adapted to and dependent upon periodic fires. Large burns from the early 1900's paved the way for population increases in the late 1940's through 1960's. Fires thinned forest overstory allowing plant communities to produce succulent grasses, forbs, and shrubs. As human settlement increased throughout the west, and fire suppression became a priority, deer habitats suffered and became overgrown. With improved wildfire fighting techniques, acreage that burned annually decreased by ten-fold. Lack of fire resulted in a lack of regeneration of young nutritious forage, decreasing habitat quality for mule deer.



BENEFITS OF WILDFIRE FOR MULE DEER

Plant communities' progress through a series of stages called succession. Mule deer thrive in early successional stages where fire or other disturbances result in a mosaic of grasses, forbs, and young or rejuvenated shrubs. In plant communities where wildfires have been excluded for long periods of time, trees or old deciduous shrubs become the dominate plants. These trees suppress understory vegetation by shading the forest floor and disproportionately using available water and soil nutrients.

Habitat change on a landscape-scale is needed for an entire mule deer population to gain critical fat reserves. Small scale fires can provide valuable local benefits to individual mule deer, but may not change plant community composition over a large enough area to make meaningful differences to an entire deer population. When wildfires are large enough to benefit the entire population the resulting fawn production and subsequent population gains are remarkable. Mule deer does with adequate fat reserves give birth to healthier fawns and are more successful in raising fawns to maturity. For example, in 2003, the Bulldog fire in southeastern Utah burned more than 30,000 acres of crucial summer and transitional ranges. After the fire, mule deer fawn recruitment went from a 5-year average of 44 fawns per 100 does to an average of 80 fawns per 100 does.

This fire provided much needed forage quality and increased quantity for mule deer. Increased body fat benefits bucks as well because when body requirements are met, surplus nutrition is available for larger antler growth. Mule deer entering winter with excellent fat reserves are less susceptible to winter die-offs because they have more surplus fat to metabolize for energy during the winter.

Large scale wildfires create vegetation in various stages of succession, resulting in increased forage production. The ash and char from wildfires releases nutrients back into the soils, increases the moisture holding capacity of soils, and facilitates increased plant growth. Smoke compounds increase germination rates and vigor of some seedlings such as bitterbrush. Additionally, heat from fires can kill parasites and diseases found in plants.

DETRIMENTS OF WILDFIRE FOR MULE DEER

An increase in the fire frequency regime can be detrimental to mule deer in areas where plant communities are at risk of being altered by invasive plants such as cheatgrass, red brome, and medusahead rye grasses. These invasive plants may increase following wildfires and reduce or prevent re-growth of desirable vegetation. Many invasive plants start growing before desirable forbs, shrubs, and grasses each year. This early growth trait allows invasive plants to strongly compete for available soil moisture and nutrients. Invasive plants also mature and dry out earlier than desirable plants, which may cause an increase in wildfire frequency. Increased fire frequency decreases diversity of plant communities that offer season-long nutrition and creates one that is dominated by a single plant species with limited nutrition for a short period of time.

Suppression techniques and climate conditions have changed and limited the natural occurring fire frequency, which has resulted in increased fuels found on the landscape. In many instances this has amplified the fire intensity, resulting in extremely hot fires. Wildfires that burn too hot can scorch the soil, burn minerals, and limit regeneration of herbaceous plants.

Winter range plant communities that evolved with fire, but have not burned in a long time eventually experience destructive burns. These burns remove essential forage and hiding/thermal cover deer rely upon during harsh winter conditions. Shrubs used for winter forage, such as sagebrush, take decades to re-establish, leaving these areas with limited value following fires. Burned areas can be rehabilitated with mechanical tools and seeding to help them recover sooner when required.



Kim Morton MD Fawn



Photo: Rebecca Barboza/CDFG

ALTERNATIVES TO FIRE

Resource managers should promote controlled burn or let-burn policies in areas where fires are beneficial to mule deer and the environment. However, in instances where wildfires pose risks to firefighters, property, or public health and safety, resource managers should seek alternative options to improve mule deer habitat. Some examples may include logging, chaining, lop and scatter, mastication and other methods to create early succession plant communities that benefit mule deer.

More information on mule deer can be found at www.muledeerworkinggroup.com

*A product of the Mule Deer Working Group - Sponsored by the Western Association of Fish & Wildlife Agencies - Approved July 2016
Produced with support from the Mule Deer Foundation (www.muledeer.org)*