

The Effects of Downy Brome Invasion on Mule Deer Habitats

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Downy brome (*Bromus tectorum*) was first identified in Nevada during the early 1900s near the town of Elko. In 1964 a firestorm, largely fueled by downy brome, swept through Elko County burning 120,000 hectares, a critical loss of big sagebrush (*Artemisia tridentata*). In 1999, 0.75 million hectares of northern Nevada rangelands burned, including much of the Elko habitat that had repeatedly burned since 1964. Prior to 1964, the Independence mule deer (*Odocoileus hemionus*) herd of northeastern Nevada was estimated at 38,000 animals. It is now estimated at 9,000 animals.

Active and aggressive management of downy brome along with the restoration of native shrub communities is critical in decreasing the frequency and intensity of wildfires.



Figure 2. Big sagebrush (*Artemisia tridentata*) utilization

Present-Day Rangelands

In Nevada, wildfires have resulted in more than 80% loss of critical habitat. Mule deer require nutritional input and cover during all life stages. Summer and transitional ranges are just as important as winter ranges. Xeric winter and transitional mule deer ranges have been affected the most by wildfire and downy brome dominance (Figure 1). In mesic sagebrush communities, a change in grazing management has promoted perennial grass establishment, simultaneously as fires decreased shrub cover (Figure 3). Both occurrences are troubling to mule deer herds and represent a critical loss of browse.



Figure 3. A mesic, mountain brush community converted to perennial grass dominance following wildfire.

Historical Perspective

Downy brome (*Bromus tectorum*) evolved where sheep, goats and cattle were first domesticated. Undetected in Nevada at the turn of the 20th century (Kennedy and Doten 1901), it now occurs on millions of hectares (Figure 1). Downy brome has halted secondary succession in these habitats. Increasing the chance of ignition as well as the rate, spread and season of wildfires, it has reduced the fire interval from an estimated 60-110 years to 5-10 years (Whisenant (1989)). A few downy brome plants (~50/m²) can out compete perennial grass seedlings and eliminate native perennial establishment (Robertson and Pearce 1945).



Figure 4. 'Immigrant' forage kochia decreasing the fuel load and providing much needed nutrition for mule deer and other wildlife.

Habitat Management

The ability of resource managers to use the best technology available for restoration/rehabilitation efforts is critically important in managing downy brome.

The use of non-native species such as crested wheatgrass and 'Immigrant' forage kochia (*Bassia prostrata*) should not be condemned. Without a decrease in fire frequency, succession to a healthy sagebrush community can not occur. These species have been well documented in fighting downy brome dominance and catastrophic wildfires (Figure 4).

Active restoration/rehabilitation along with aggressive weed control programs are fundamental in restoring mule deer habitats and decreasing the conversion of sagebrush bunchgrass communities to downy brome dominance.



Figure 1. Former big sagebrush/bunchgrass community converted to downy brome dominance through recurring wildfires.

Early Accounts

During 1830-1850 early trappers like Peter Skeen Ogden, John Work and Jedidiah Smith journeyed through the Great Basin documenting the lack of game, including mule deer. Despite being the epitome of professional hunters, they often found themselves hungry and killing their own horses to survive. A century later, on the same landscape, mule deer were plentiful.

Livestock Introduction

Domestic grazing of the western Great Basin began in the 1860s. The preferred perennial grasses were grazed year after year without rest, resulting in an increase of less desirable woody species like sagebrush. In addition, the lack of understory plants reduced fires leading to larger more vigorous, and dense stands of shrubs (Figure 2). This vegetation change was beneficial to mule deer herds throughout the West. (Gruell 1986).