



CARRYING CAPACITY - HOW MANY DEER CAN WE HAVE? Fact Sheet #5

BACKGROUND

The land can only support a limited number of animals before resources are depleted. Exceeding the land's resources results in poor animal body condition, fewer fawns surviving to adulthood, and eventual damage to the habitat. Therefore, understanding relationships between mule deer and their habitats is necessary for understanding deer themselves.

Most livestock operators understand the concept of carrying capacity, which is the number of animals a given amount of land can support sustainably. A pasture or allotment can only feed a certain number of cattle in a given year.



This concept also applies to wildlife. As animal density increases, or habitat quality or quantity decreases, deer productivity and survival decline. The number of deer the land can sustain over the long term ultimately is determined by the available habitat – food, water, and space. It is important to note that carrying capacity varies seasonally, annually, and over time in accordance with changing habitat conditions.

THE INFLUENCE OF HABITAT

Mule deer habitat is affected by a combination of many factors, including fire suppression, oil-gas-mineral mining, habitat fragmentation, spread of invasive plants, drought, competition between species, livestock management, and other human factors such as urban development. Many of these changes to deer habitat reduce carrying capacity.

Mule deer occur in a diverse set of environmental and climatic conditions and limiting factors to population size vary by habitat type. In much of their southern ranges, desert-like conditions prevail and precipitation is a key limiting factor to populations. In other climates, mule deer can be limited by winter range and snow accumulation. Mule deer thrive in young habitats, where forbs, grasses, and shrubs dominate the landscape. As forests age, less nutrients, light, and water are available for the forage plants deer prefer, so forage quality declines. Although the acres of habitat may not change, mule deer carrying capacity can vary significantly.

Quality habitat increases fawn survival. This results in a productive population and more buck hunting opportunity because half of the fawns that survive to adulthood are bucks.

MONITORING

Because carrying capacity is always changing, it is difficult and expensive to measure over the entire landscape. Therefore, we monitor deer population performance in several ways that tell us whether the size of the population is appropriate for the amount and quality of available forage.

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Key indicators include density, survival, body condition (fat deposition), reproduction, and recruitment (juvenile survival to adulthood). In locally dense populations or high population years, it also is important to measure habitat conditions to prevent over-grazing of preferred forage plants.

THE SCIENCE OF HABITAT LIMITATION

Several studies have shown that deer populations are limited by available habitat.

- In Colorado, experimentally increasing deer nutrition increased fawn and adult survival by reducing predation and malnutrition rates.
- Another Colorado study showed that fawns wintering in habitat treatments that removed trees and weeds had significantly higher survival than fawns in untreated areas.
- In the Desert Southwest, research documented low precipitation is directly related to poor body condition and high mortality of adult deer due to malnutrition.
- Several studies and experiments have demonstrated that poor body condition also reduces pregnancy rates and fawn survival.

MANAGEMENT IMPLICATIONS

Managers use all of this information to align deer populations with the available habitat. These studies emphasize the importance of setting realistic population objectives to help prevent large-scale die-offs during drought or severe winters. Managers seek to achieve population objectives in several important ways:

- If a population is above its population objective, doe harvest can reduce the population to levels appropriate for the habitat.
- In winter-stressed herds, travel and recreation closures are used to reduce disturbance and increase survival.
- Managers can increase habitat quality through the use of prescribed fire or mechanical treatments to reduce tree cover and by making sure grazing levels are appropriate.
- Habitat conservation is critical for the future of mule deer.

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