WHITE-TAILED AND MULE DEER ECOLOGICAL INTERACTIONS
Fact Sheet #23

OVERVIEW
Mule deer and white-tailed deer occur together in many habitats from Canada to Mexico. In some areas, while mule deer populations have declined, white-tailed deer have increased or expanded. Mule deer enthusiasts often express concern that white-tailed deer may out-compete mule deer or displace them in certain areas. While the range of white-tailed deer in North America has been increasing since at least the early 1970s for a variety of reasons, the relationship between deer species and their habitats is dynamic and variable.

POTENTIAL COMPETITION FACTORS
Competition occurs when two wildlife species share a limited resource, and one or both species suffer as a result. Mule deer and white-tailed deer are closely related species, but mule deer tend to occupy habitats that are more open, arid, and often with more topographic features. In contrast, white-tailed deer are generally associated with habitats that are wetter, and include more tree cover, shrubs, and agricultural lands. Mule deer and white-tailed deer typically avoid each other and remain mostly segregated by vegetation association or elevation, which minimizes competition. This spatial separation seems to hold true during winter months when resources are most limited.

Despite differences in habitat preferences, their diets are similar and often reflective of simply what forage is available. Dietary overlap does not necessarily mean two species are competing because adequate forage may be available to support both. However, overlapping dietary preferences sets the stage for potential competition. If one species avoids another species and uses less optimal habitat as a result, competition may negatively affect the submissive species. Documentation of behavioral interactions between mule deer and white-tailed deer are limited, but one study in the southwestern US reported mule deer were dominant over Coues white-tailed deer in all behavioral interactions observed.


Photo: Warren Conway

ALTERED HABITAT EFFECTS
Humans continue to change the natural habitats throughout mule deer and white-tailed deer range. Agriculture, energy development, roads, invasive species, brush encroachment, and urban sprawl are replacing and altering important winter and summer deer ranges. Traditional migration routes in many western mule deer populations have also been disrupted by human activities.

White-tailed deer are known for their remarkable adaptability to changes in disturbance or habitat. Habitats that have been minimally altered by the planting of small parcels of agricultural crops may be readily used by both deer species; however, white-tailed deer fare better in areas converted to predominantly agriculture. Since white-tailed deer prefer areas of thicker vegetation which has generally increased due to excessive herbivory and fire suppression, human-caused changes to the environment benefit white-tailed deer more than mule deer.

VULNERABILITY TO PREDATORS AND HUNTERS

Mule deer rely on a bounding gait to negotiate rough terrain and avoid predators, while white-tailed deer use speed to outrun predators or hide in dense cover. These adaptive strategies have served each species well, but changes in predator species and density, habitat loss and conversion, and substantial hunting pressure could impact their effectiveness. Cougars inhabit most deer habitats across the west, and some research suggests cougars may prey on mule deer disproportionately compared to white-tailed deer, which could result in a competitive disadvantage to mule deer.

State and provincial wildlife agencies adjust hunting season regulations and permits to ensure that deer populations are sustainable. The two species do not evade hunters in the same manner, however, and the stotting gait of the mule deer is less effective to avoid hunters with modern firearms. If necessary, hunting regulations can be used by state or provincial wildlife agencies to limit harvest of one species, while being more liberal with the other.

DEADLY PARASITES AND DISEASES

A common parasite of white-tailed deer, especially in the eastern US, is a meningeal brain worm named Parelaphostrongylus tenuis. This parasite generally causes no serious problems in white-tailed deer, but is often fatal in mule deer, moose, and elk. If a sufficient intermediate snail or slug host population exists, this parasite could potentially spread with any expansion of white-tailed deer, resulting in increased mule deer mortality where both species occur. Conversely, disease caused by the Epizootic Hemorrhagic Disease (EHD) virus and the bluetongue virus, occurs in both species but typically impacts white-tailed deer populations much more.

Photo: Bob Robb

CONCLUSIONS AND RECOMMENDATIONS

In general, competitive interactions between mule deer and white-tailed deer are possible, but unlikely to be at levels that impact survival or reproduction since they occupy slightly different ecological niches and show some avoidance to one another. While there have been areas where mule deer populations decreased while white-tailed deer increased, there have also been areas where the opposite occurred or populations of both species increased or decreased. Other factors such as reproductive potential, habitat change, predation, disease, weather, and other mortality factors likely play a bigger role than competition in the expansion or declines of either species.

Coexistence of both deer species is possible, and the density of deer that habitats can support is likely higher if two species are present. White-tailed deer are abundant and the most popular hunted species in the US and provide important recreational hunting opportunities were mule deer numbers are depressed. Similarly, species-specific management such as habitat manipulation or hunting licenses valid for only one species could be used to manage the relative levels of each species. Substantial uncertainty occurs in our knowledge of the relationships between mule deer, white-tailed deer, habitat change, environmental influences, and the effects of other mortality factors. Wildlife management agencies continue to implement habitat and species management practices based on the best current science available.

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

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