MULE DEER AND WHITE-TAILED DEER HYBRIDIZATION
Fact Sheet #30

Overview

White-tailed deer and mule deer hybrids have been reported in captivity as early as 1898 when a whitetail and mule deer produced a fawn at the Cincinnati Zoo. Researchers also successfully produced whitetail x blacktail hybrids in captivity. Male hybrids between these 2 species are almost always sterile, but female hybrids can breed back to either parent species. Hybrids are very uncommon and can only be identified by genetic analysis or inspection of the metatarsal glands.

Hybrids are Real, but Rare

Throughout history, the hybridization of two different species has been a popular topic. Even the mule deer was described by John J. Audubon as having fur like an elk, but hooves like a whitetail. The very scientific

Photo: Jesse Lim

name of mule deer *"Odocoileus hemionus"* means "deer that is half mule." Different species of animals, even closely related ones, are normally kept from breeding by being geographically separated from one another, or because they live in different types of habitat. If animals coexist in the same habitat, like whitetails and mule deer sometimes do, they generally have different courtship and breeding behavior to prevent hybridization. Whitetail x mule deer hybrids in the wild have been reported just about everywhere the two species coexist. Despite their widespread occurrences, true hybrids are actually very uncommon. The scarcity of confirmed hybrids among the hundreds of thousands of deer that are observed each year throughout the range of overlap illustrates how rare they are. Every year numerous reports are received of "hybrid" deer, but most are not.

Photo: George Andrejko

Meet the Parents

Being able to accurately identify both species is especially important in areas where the ranges of whitetails and mule deer overlap. This is most important for hunters because hunt permits are often prescribed separately for each deer species. Mule deer differ from whitetails in several characteristics such as tails, facial markings, antlers, preorbital (front of the eye) glands, ears, and metatarsal glands. Unfortunately, there is enough variation of these characteristics in each species to sometimes present interesting specimens that cannot be quickly identified. Some of the identifying characteristics, when used alone can be confusing or yield an incorrect identification. It is important to use all the information available when differentiating these deer species.

The Lowdown on Hybrids

In rare cases, the many barriers to hybridization fail and, for the most part, the resulting offspring look like a mixture of the two species. The tail of a hybrid looks very much like a typical whitetail but is usually longer and darker. Antlers are typically more whitetail-like but may fork in older hybrids. Some mature hybrid bucks have antlers with "wavy" tines as if the antlers were receiving mixed signals about which way to grow.

The only physical character that can be used to accurately diagnose a hybrid is the metatarsal gland on the outside of the hind leg. In mule deer, these glands are high on the lower leg, 4 to 6 inches long, and surrounded by brown fur. The whitetail's are below the mid-point of the lower leg, usually less than 1 inch, and surrounded by white hairs. A hybrid has metatarsal glands that split the difference, usually measuring between 2-4 inches, sometimes with white hairs and sometimes not.

Survival is very low in hybrid fawns even when pampered in a captive facility. Survival in the wild is even more difficult when food doesn't come from a feed trough and there's no fence to protect them from predators. To complicate matters, hybrids inherit predator escape strategies from both parents, but whitetail and mule deer have very different techniques for escaping predators. The whitetail's key to escaping is speed - they try to put as much distance between themselves and the predator as fast as possible. Mule deer, on the other hand, have developed a pogo stick-like bounding called "stotting." Research has shown that a hybrid's escape behavior is mixed up because they seem to approach the threat and then jump around in confusion. Hybridization seems to happen more often by a whitetail buck breeding a mule deer doe. This is probably because whitetails are much more aggressive in their breeding behavior and mule deer females are not used to running relentlessly from a pursuing buck.

Unraveling the DNA

Recent advances in genetic analysis techniques allows us to look at more definitive things than ears and antlers. Although we know a lot about the physical features of hybrids, there are cases where the diagnostic parts of a harvested animal are not retained by the hunter. Also, a first generation (50:50) female hybrid may breed with a pure mule deer buck and the offspring will be ¾ mule deer. This female offspring may breed with a pure mule deer, resulting in deer that are 7/8 mule deer and these are not easily distinguished from pure mule deer. There is now a genetic test to diagnose a hybrid using fresh tissue or even dried skin, bone, or antler. This test can identify animals that are a first generation hybrid (half mule deer and half whitetail) and those that are a second generation hybrid (1/4-3/4) with a high degree of confidence. Animals that represent three or more generations of backcrossing can often be differentiated from pure animals, but their exact pedigree may not be known.

The fact that deer hybridize has raised concerns for mule deer, but the barriers to hybridization, low survival of hybrid fawns, sterility of males, and demonstrated rarity of hybrids argues against this being a threat to the future of mule deer. It is unlikely anyone can reliably identify a hybrid through a riflescope so hunters must exercise caution and be confident in their species identification.

Photo: John Heale

Mule Deer
Whitetail

Hybrid

Photo: John Holcomb