



# Competition Among Aoudad, Desert Bighorn Sheep, and Mule Deer in the Trans-Pecos

Article by OLIVIA GRAY, JUSTIN T. FRENCH and CARLOS E. GONZALEZ



Photo by Justin Celest

Graduate student researcher Olivia Gray (pictured here) and her research team collected fecal samples from desert bighorn sheep, aoudad, and desert mule deer to compare forage preferences between the three species.

**D**esert bighorn sheep and mule deer are species of concern in Texas. Early in the last century, habitat loss, unregulated hunting, and the introduction of livestock diseases led to the decline of mule deer and the complete extirpation of bighorn sheep in the Trans-Pecos. Fortunately, beginning in the mid-1900s, restoration efforts were implemented and both species were successfully reestablished across their historic range.

Around the same time those two native species were reintroduced, aoudad were introduced onto the Texas landscape. Originally from Northern Africa, this non-native invasive species came to Texas in the mid-20th century when 44 individuals were released into Palo Duro Canyon. By 1999, upwards of 20,000 aoudad were reported throughout the state.

Aoudad are a very gregarious species and have adapted well to the rough terrain of the Trans-Pecos. Females can be sexually mature at nine months old, with a gestation period of only 22

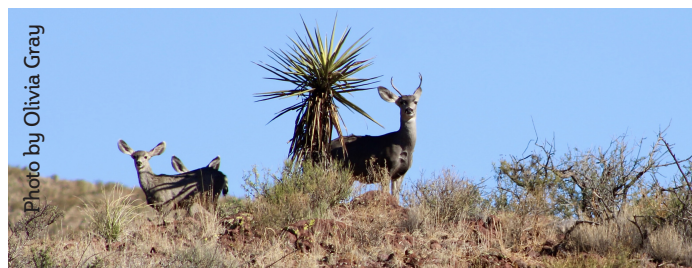


Photo by Olivia Gray

Mule deer are one of three species being observed for behavior and diet comparisons in West Texas.



Respect Big Bend

PARTNERING TO CONSERVE FAR WEST TEXAS



weeks, often producing twins. The ability to reproduce at such a young age, produce twins, and a shorter pregnancy time could result in population growth rates much higher than that of mule deer and bighorn sheep.

The similarity of anatomy and native ranges of aoudad with native desert bighorn sheep and mule deer suggests that aoudad may share common behaviors and preferences with our two native species. If this is the case, there is concern that aoudad could compete with native species for already scarce desert resources such as food and water, compromising the restoration efforts of our native species.

Since the introduction of aoudad into Texas, little has been researched on the degree of competitive interactions between these three ungulate species. Luckily, Borderlands Research Institute along with TPWD are finally looking to tackle these research questions through what we have coined as our BAM project (bighorn, aoudad, mule deer).

This study initially set out to answer the question of how aoudad habitat preferences are similar to mule deer and desert bighorn sheep by collaring more than 100 individuals of all three species in the Van Horn Mountains. From this, we found aoudad and desert bighorn sheep select for a narrow breadth of escape terrain as well as a high degree of overlap spatially in optimal habitat. Mule deer showed a weaker selection for escape terrain, and their habitat distribution only marginally overlapped with aoudad and bighorn.

This information indicated we needed to investigate finer scale interactions of these three species, such as diet overlap and potential temporal partitioning, to understand more fully when competition could be occurring.

While some information about the diets of all three ungulate species individually is available, there is currently no information on overlap of diet when these species overlap on the landscape. When species coexist, they modify how they use resources to limit competition. This is not always possible in places like the Chihuahuan Desert where low rainfall limits the amount of quality forage for a large portion of the year. Through our study, we

want to understand how dietary overlap changes throughout the year.

Our fieldwork consists of collecting fecal samples of all three species monthly over a year in the Van Horn Mountains. We are currently conducting microhistology analysis on all the fecal samples. This entails grinding and bleaching the fecal samples, mounting them on slides, and looking at them under a microscope. By doing this, we can identify specific plant cell fragments down to the species, giving us a detailed description of diet composition from each species every month. This will show when and to what degree diet is overlapping between all three species.

Since we already know there is already habitat overlap between these species in the Van Horn Mountains, here are the next questions to answer: are bighorn sheep, aoudad, and mule deer using resources at the same time? Or are they partitioning themselves through time to limit competition?

Using collar data, our team is inspecting cycles in resource use of each species through time, including water sources,

vegetation resources, aspect, and escape cover. Using resources on different cycles—for instance, diurnal (daytime) vs. crepuscular (twilight)—may indicate temporal partitioning of those resources.

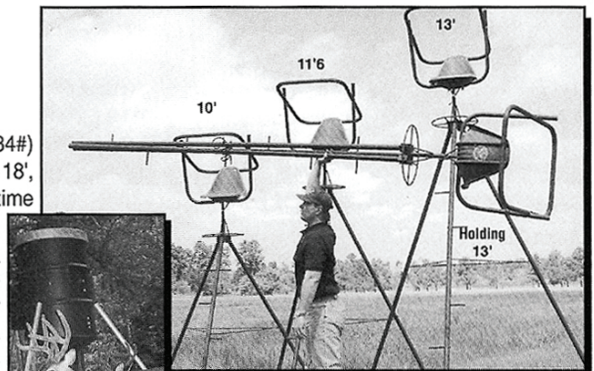
We are studying these cycles through time to determine changes in resource importance to these ungulates and how temporal partitioning of resources changes throughout the year. This information will identify when these resources most influence movement behavior, as well as both when and how these species manage competition for them.

The BAM project ensures we fill gaps in knowledge about aoudad and more specifically their interactions with our two native ungulates. All these questions, those we have answered and those we are continuing to answer through our research, will allow managers to target management actions in specific places, at specific times, to achieve specific results. Data like these will help assure the long-term success of mule deer and desert bighorn sheep restoration in Texas. 🍷

## SOUTH TEXAS TRIPODS & FEEDERS

Tripods, rifle and lightweight (34#) bowhunter models from 10' to 18', camo covers available. Life time warranty, the #1 tripod in America. The feeder with electronics that last! The same quality built feeder electronics for over 30 years backed by our 5 year electronics warranty.

- 24 Hr. Timers
- 5 Yr Electronics Warranty
  - Solar Panels
  - Water Stations
  - Varmint Guards
- Winch Up Kits Available
  - Hog Traps
- Industrial Road Feeders
- Portable All-Purpose Ground Blinds



Call or write for free brochure:  
**South Texas Tripods & Feeders, Inc.**  
23019 #1 I-45 • Spring, TX 77389-4211

Orders: 1-800-593-4422  
VISA • MASTERCARD • DISCOVER • AMEX

