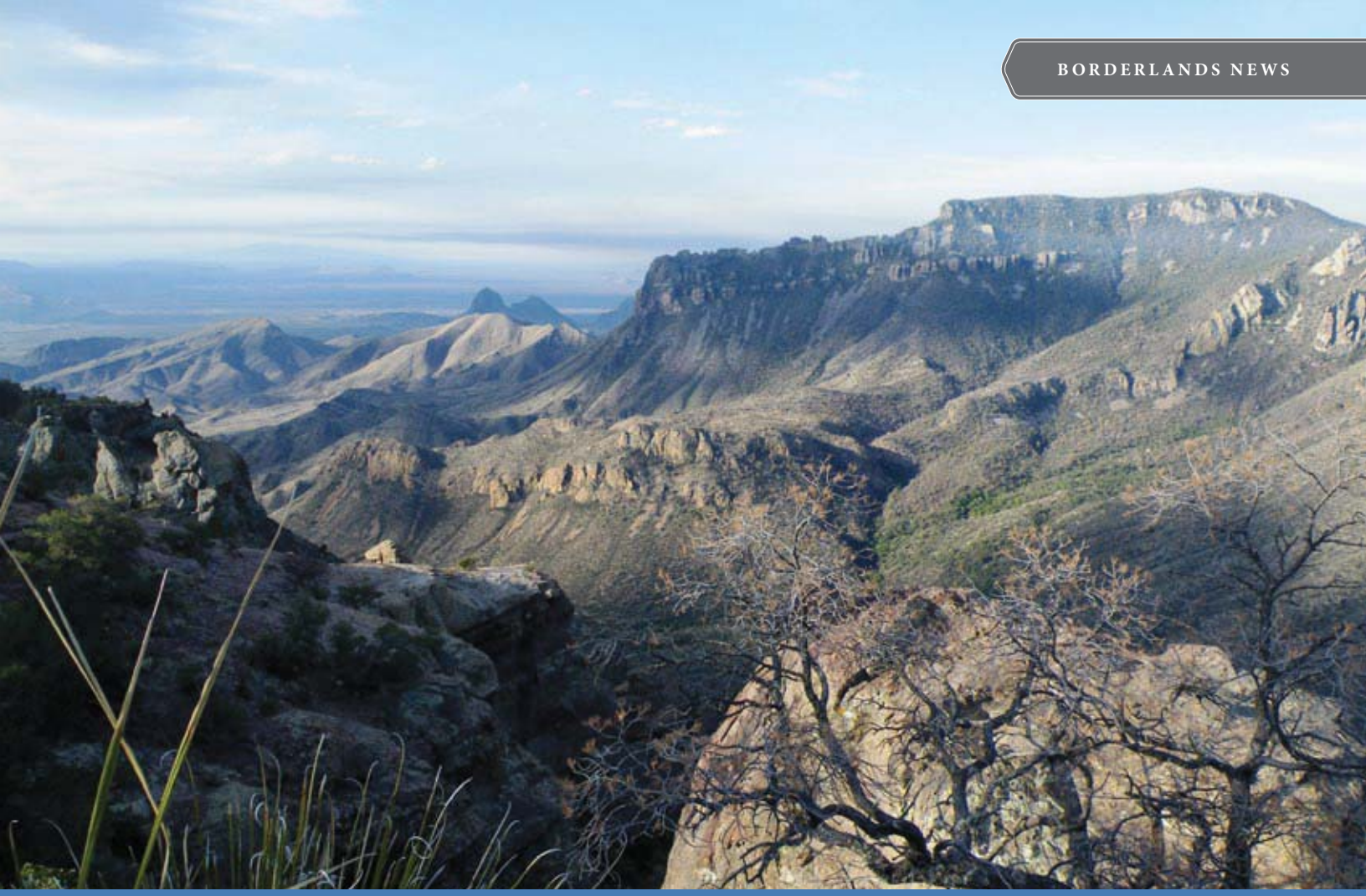
Evaluation of Survey Techniques for Desert Mule Deer in the Trans-Pecos Region of Texas

article and photos by **JUSTIN HOFFMAN,**
Graduate Assistant, Borderlands Research Institute; Dr. Louis A. Harveson, Director, Borderlands Research Institute; and Shawn Gray, Pronghorn and Mule Deer Program Leader, Texas Parks and Wildlife Department

Mule deer are one of the most prized game species in the western United States. In the Panhandle and Trans-Pecos regions, area ranchers and landowners recognize mule deer to have both economic and aesthetic value and are regarded as a precious resource. More sportsmen realize the true trophy qualities that mule deer exhibit, from their larger body sizes and ability to grow massive antlers. In recent years, mule deer have gained more attention with more emphasis on their management. In the past decade alone, the Texas Parks and Wildlife Department (TPWD) has made several regulation changes from season lengths and timing to applying the Managed Lands Deer Permit (MLDP) to mule deer. However, research and relative knowledge of how to manage this species is generally lacking in Texas, especially when compared to its counterpart, the white-tailed deer. Generally, one may think the same management implications prescribed for white-tailed deer can also be applied to mule deer. However, the results are often variable and unsuccessful. Therefore, the Borderlands Research Institute at Sul Ross State University, the Texas Parks and Wildlife Department (TPWD), and West Texas landowners have initiated several studies focused on mule deer management.

DESERT MULE DEER have emerged a prized trophy by hunters across the western United States. The first step in their management is having accurate and precise population estimates.

One challenge that was acknowledged was how to effectively estimate and monitor mule deer populations in Texas. Due to their limited distribution and lower densities, accurate population estimates are critical. Although TPWD annually surveys mule deer populations, there still remains a strong dependency to rely on private landowners to both understand and effectively estimate and manage the mule deer herds (especially with the implementation of the MLDP program). As a result, we designed a research study to evaluate the standard survey techniques for estimating mule deer populations in the Trans-Pecos. Currently, TPWD utilizes helicopters to survey mule deer populations by flying pre-designated transects. Private landowners in this region often utilize a spotlight survey which simply involves driving a route with two observers with



THE RUGGED TERRAIN of the Trans-Pecos provides a unique challenge to all survey techniques designed to survey mule deer herds. Well-designed survey routes, whether by air or land, are prerequisite to adequately monitoring your mule deer herd.

spotlights in the back of a vehicle counting deer that are observed. Another technique is daytime, roadside surveys that involve driving a route with two observers counting observed deer during daylight hours. We evaluated all three of these common techniques to determine their effectiveness in estimating mule deer populations, including herd composition (e.g., sex ratios, fawn productivity).

The research study was conducted on three different sites in the Trans-Pecos region during winter and spring 2010. A total of 15 spotlight and roadside surveys were conducted. Helicopter survey data was provided by a concurrent study on two of the three research sites. We compared both population and herd composition data between each survey technique to determine differences and effectiveness of each. Essentially, we found that helicopter surveys provided the most consistent and precise population and herd composition data, when compared to the spotlight and roadside surveys. Roadside (daytime) surveys generally yielded a lower deer density compared to the other survey techniques, but herd composition estimates were similar to helicopter surveys. Spotlight surveys generally yielded the most variable herd composition estimates; however, population estimates were similar to helicopter surveys.

Helicopter surveys were the most effective in producing precise population and herd composition estimates. Precision of survey results are rarely questioned. However, disadvantages to this technique are high costs and sightability. Many studies have confirmed that helicopter surveys

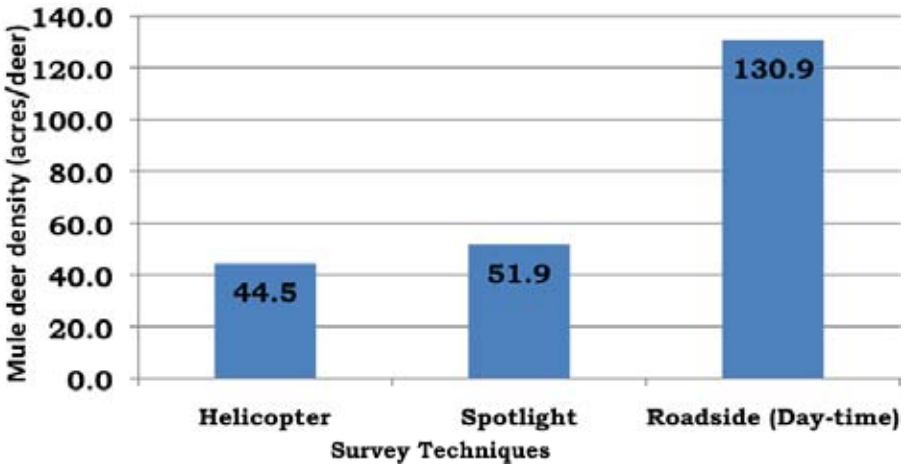


FIGURE 1 A comparison of mule deer density estimates for one of the research sites evaluated. Note that roadside counts have the propensity to underestimate mule deer density compared to helicopter and spotlight surveys.

generally underestimate deer populations by only observing a proportion of deer that inhabit the surveyed areas. In fact, data from a recent mule deer sightability study conducted on several ranches throughout West Texas indicated that, on average, only about half of the mule deer flown over are observed during a helicopter survey.

We found roadside (daytime) surveys to provide reliable herd composition estimates, but they generally yield much lower population estimates because of the cryptic nature of mule deer and sightability issues. Lastly, spotlight surveys (which are popular for their affordability and simplicity) provided reliable population estimates but yielded often variable herd composition data because of visibility issues during the nighttime hours. Spotlight surveys, when designed and utilized correctly, are very effective in estimating reliable population and herd composition data. Variable or inaccurate survey results from spotlight surveys are usually a result of poor design or incorrect utilization.

Each survey technique poses advantages and disadvantages and should be used to accommodate the unique features of each property. Although helicopter surveys can be costly, they did provide the most precise herd composition and population density data. However, our data suggest that spotlight and roadside (daytime) surveys produce reliable population and herd composition data for adequate population management for mule deer. This is especially true if they are used in tandem (spotlights for density; roadside counts for herd composition). Along with the affordability and simplicity of ground surveys (spotlight, roadside surveys); correct design and utilization will produce reliable and accurate population and herd composition data to effectively manage your property's mule deer population.