



MULE DEER MONITORING PROGRAM

INVESTING IN THE FUTURE OF WYOMING'S HERDS



2025 ANNUAL REPORT



OVERVIEW

In 2022 the Wyoming Game and Fish Department, alongside partners, began a cutting-edge research and monitoring program to better understand mule deer populations across the state. Over the past three years the program has delivered critical information, such as:



Precise information on harvest and public values.



Robust data on herd composition and trends.



Disease assessments.



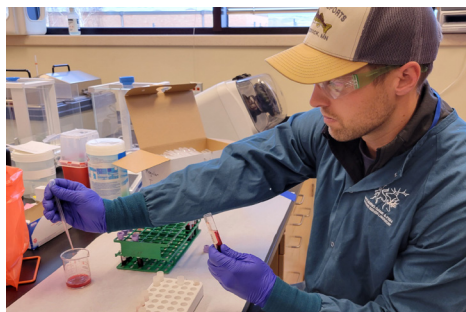
Updated abundance estimates.



Current data that's accurate and immediately available.



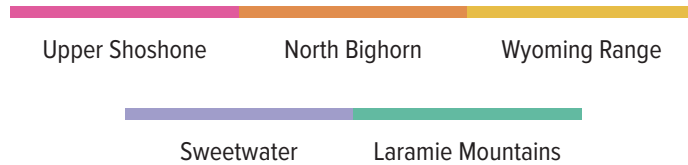
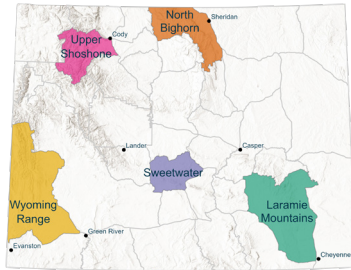
Assessments of survival, movement and habitat use.



PROJECT ACTIVITIES

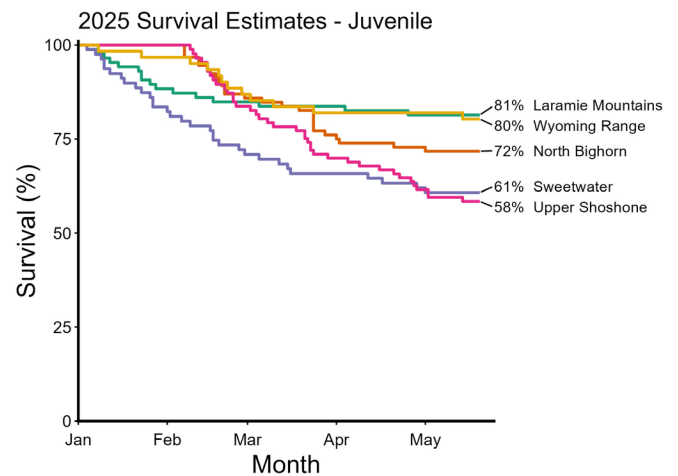
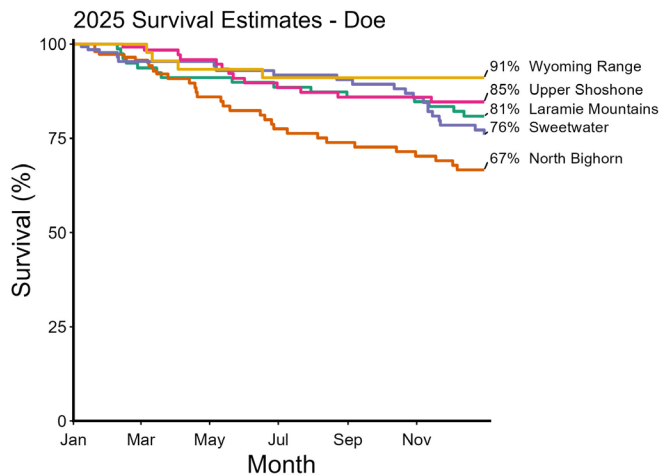
Survival

Survival is an important component driving mule deer populations. To track where, why, and how well mule deer survive, managers have spent three years deploying GPS collars across five geographically distinct herds, known as Focal Herds. Monitoring these separate populations reveals how different weather, predators, diseases, and habitats impact survival. With over 3,600 animals enrolled to date, this is one of North America's largest mule deer studies. The data provides a detailed map of mule deer survival in Wyoming, allowing personnel and partners to deploy targeted management actions to help address barriers to survival.

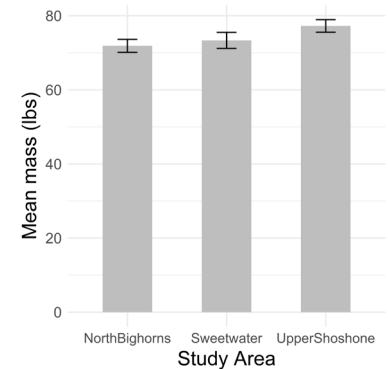
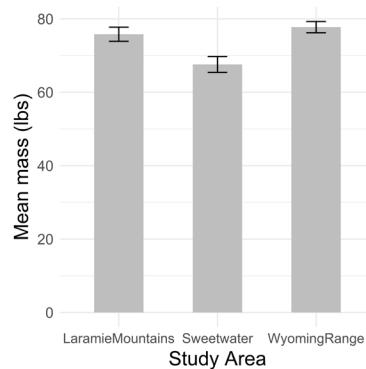


DOE

JUVENILE



Each winter, managers weigh 40 juveniles from each of the five focal herds. On average, a 6-month old mule deer weighs around 75 pounds, but can range from around 50 pounds to over 100 pounds. Bigger juveniles, usually those coming into winter with more body mass, tend to survive better. These data help managers understand how juvenile weights compare both across the state, and across years with very different winter conditions. The figure to the right shows average juvenile mass for each herd across 3 years of data.



Juveniles caught within the same 16-day period are included in comparisons. The figure on the left shows animals captured in December of each year. The figure on the right shows data from animals captured in January.

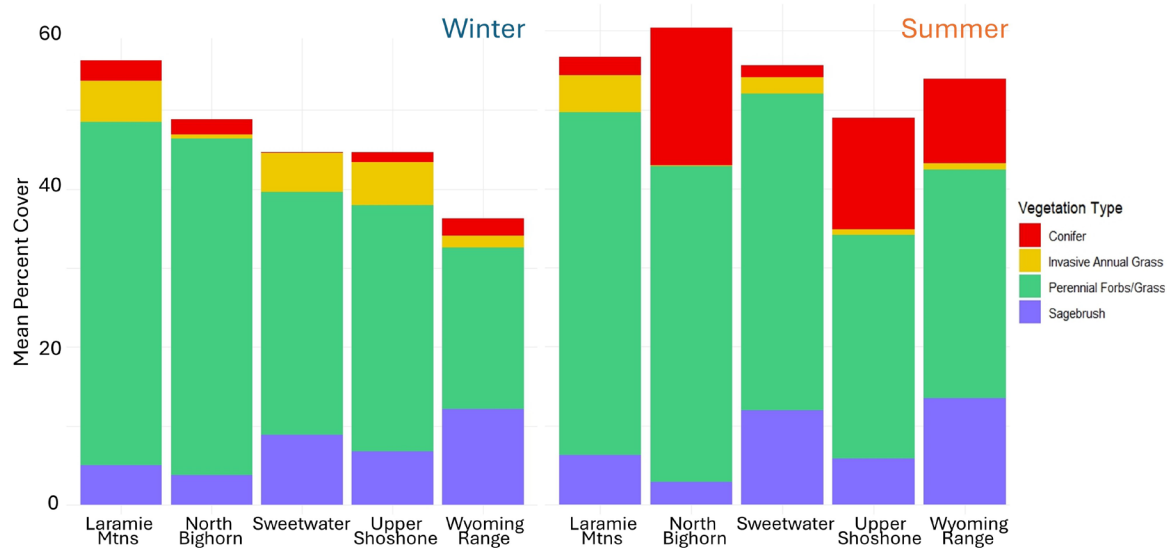
Habitat Matters

Wyoming is a big place. From low-elevation grassland ecosystems to snow-capped alpine environments, mule deer find a home in nearly every corner of the state. To better understand how mule deer make a living across such vastly different places, managers are evaluating both the habitat resources available to deer, and how the resources that deer need change based on the herds in which they live.

A first step in this work is to understand how the amount of potentially important food resources, such as shrubs, differs between herds. Using GPS data from the five Focal Herds biologists found that, while

every herd generally has access to the same categories of resources, the amount (or percent cover) varies substantially. For example, deer in the Sweetwater and Wyoming Range herds have more sagebrush, a primary winter food source, available to them during winter than the other three herds in the study. While much remains to be learned about the quality of resources in each herd, these analyses are an important starting point. Nuanced information on resource availability can help managers continue to tailor habitat improvement efforts to the specific needs of each herd.

Available Vegetation on Home Ranges



New Technology Update

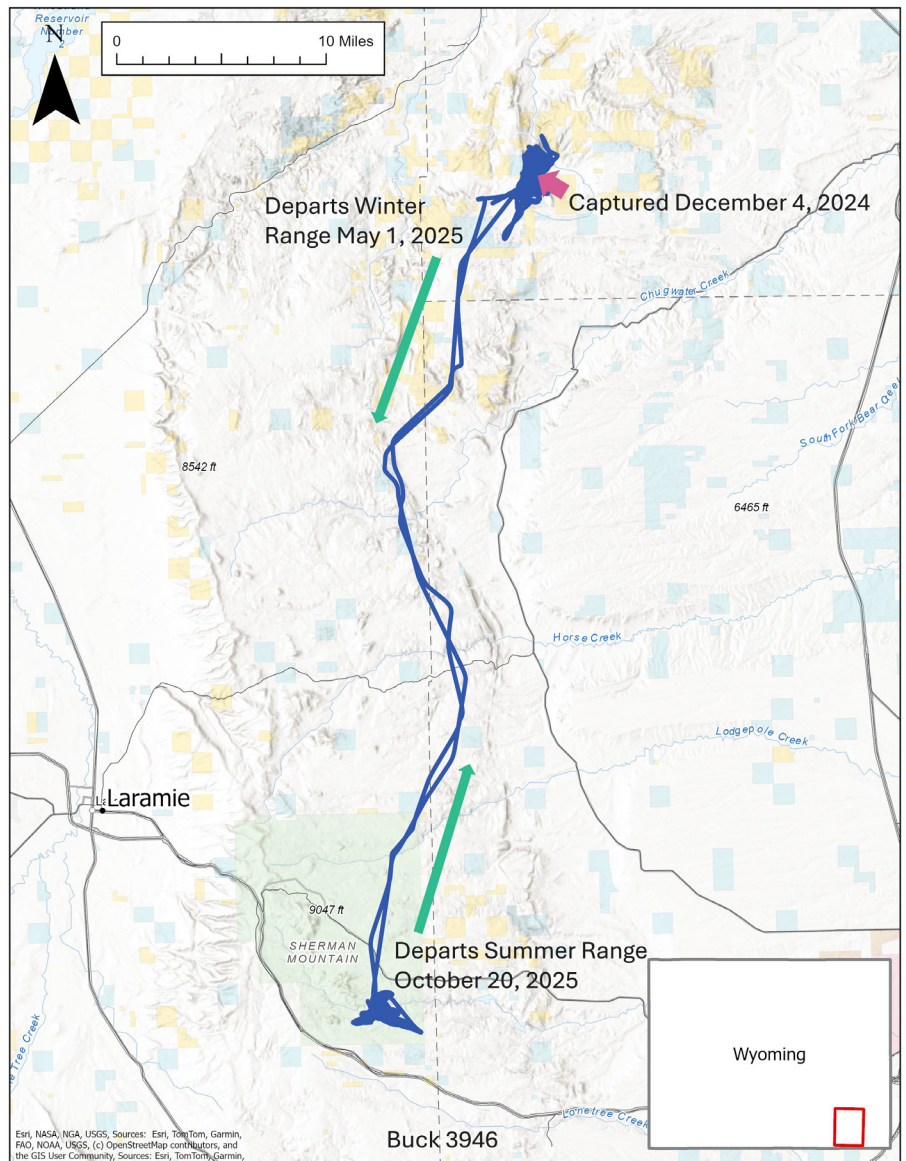
In 2024, managers fit 25 adult females across five herds with GPS collars equipped with video cameras. The footage from these collars has helped the department to better understand how deer interact with their environment, other species, and each other. These videos also give managers a glimpse into the secretive world of mule deer reproduction. Fawn videos aren't just cute! They also provide rare insight into the timing of birth events, the number of fawns born to each doe, and early fawn survival.



Solar Powered GPS Ear Tags

WGFD is in the concluding phases of testing of solar-powered GPS ear tags (tags). The tags, attached like a cattle-tag, take GPS locations 4 times a day, charge themselves via sunlight, and weigh about as much as an AA battery. Since 2022 WGFD has deployed 98 tags on free ranging mule deer. Like any small electronic device there are challenges with durability and longevity, particularly under extreme environmental conditions. However, tags may offer some distinct advantages for tracking mule deer in some contexts.

Unlike GPS collars which are tailored to fit individuals of a specific age and sex, GPS ear tags provide wildlife biologists an opportunity to track mule deer from early life stages into adulthood regardless of its sex or age. For example, the neck size of a 6-month-old mule deer is roughly the circumference of a grapefruit. As mule deer grow into adulthood their neck size increases, and for adult bucks, necks may exceed the circumference of a 1-gallon paint can. With traditional GPS collars, these changes in neck size must be accounted for by either incorporating expansion mechanisms, releasing the collar prior to significant neck growth, or recapturing and re-fitting individuals with the appropriately sized collar.



Success story

A success story of the GPS ear tag trials is buck 3946. WGFD tagged 3946 with a solar-powered GPS ear tag as a 6-month-old in December of 2024 near Sybille Canyon in Southeast Wyoming. The following May, the buck migrated over 50 miles to summer range near the Vedauwoo area and continues this migration today. Buck 3946, now approaching 2 years old, showcases to what GPS ear tag technology offers wildlife biologists in terms of understanding movements from early life stages to adulthood, while reducing concerns of the device's impact as the individual grows.

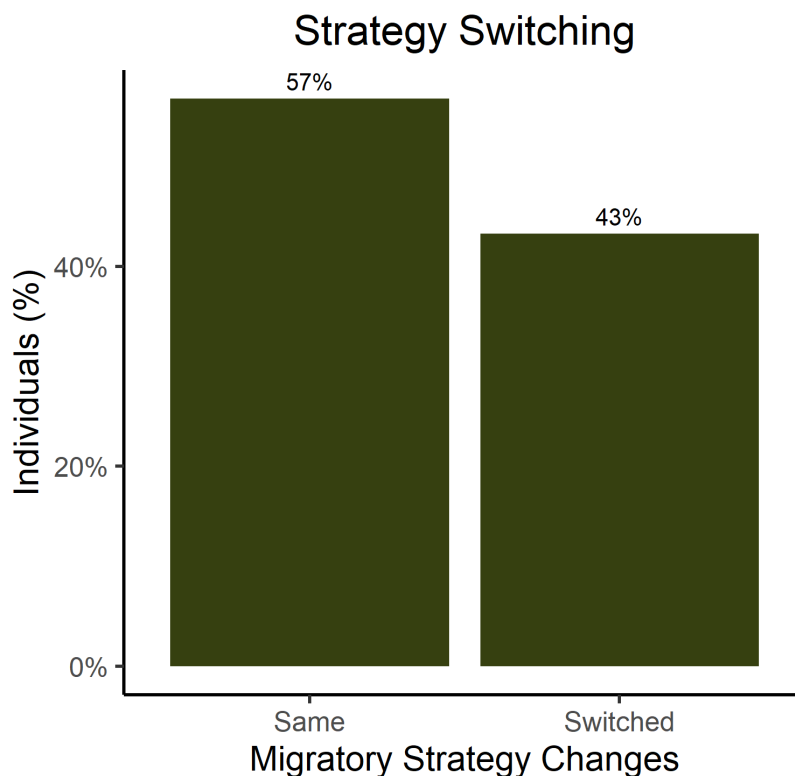


Elk Monitoring

While some elk populations are growing in places where mule deer are declining, there's a lot that managers don't know about the ecological connections between the two species. In February 2024, the Department marked 120 cow elk in areas that overlapped with marked mule deer in the Laramie Mountains herd. This study design allows managers to evaluate how elk movement and habitat use affects mule deer distributions. As an important first step, elk movements were classified into seven migration strategies ranging from full residency to complex multi-range migrations, allowing for detailed characterization of how individuals used the landscape. Preliminary analysis of 75 elk indicates that the most common strategy in the Laramie Mountains is residency, with many individuals maintaining a single home range and exhibiting little to no large-scale movement.



Surprisingly, approximately 43% of elk changed their migratory strategy between years, demonstrating a high degree of behavioral flexibility. This variability likely reflects the absence of traditional migration drivers in the study area, including strong topographic gradients, pronounced seasonal habitat or dietary shifts, and severe winter conditions. Collars will remain on elk for the next few years. Biologists will use information about elk migratory strategies to help inform ongoing harvest management, and to better quantify the effects of elk movement on mule deer.



MANAGEMENT APPLICATIONS



Location data to support **wildlife crossing projects**



Habitat use data to support **turbine siting recommendations**



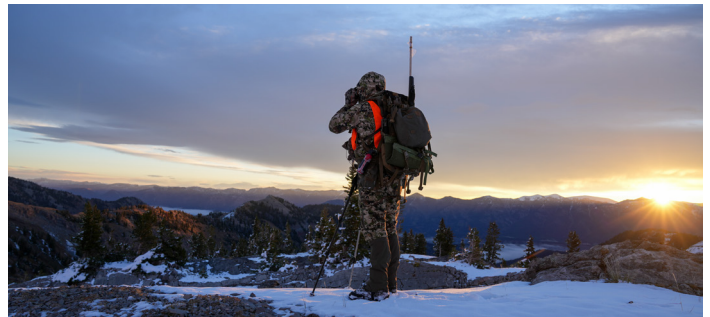
Movement data to support **county-sponsored housing development** recommendations



Identify areas where **habitat improvement projects** will be most beneficial to mule deer on the Bridger-Teton Forest



Outline **population threats and potential conservation opportunities** as part of the Absaroka Front Big Game Herd Assessment



Inform 2026 **hunting season recommendations and population estimates**



Evaluate and prioritize placement of **wildlife friendly fencing**

NEXT STEPS

As the last year of animal captures approaches, the Department and partners are focused on learning as much as we can about mule deer populations and best-management practices across the state. This includes early work on using blood samples to determine the age of a deer, understanding how the timing of birth events varies with weather and habitat resources, and using population metrics to prioritize places for on-the-ground conservation actions.

PARTNERS

