MULE DEER MONITORING PROGRAM

INVESTING IN THE FUTURE OF WYOMING'S HERDS

2024 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 two years the program has delivered critical information, such as:

Precise information on harvest and public values.

Robust data on herd composition and trends.

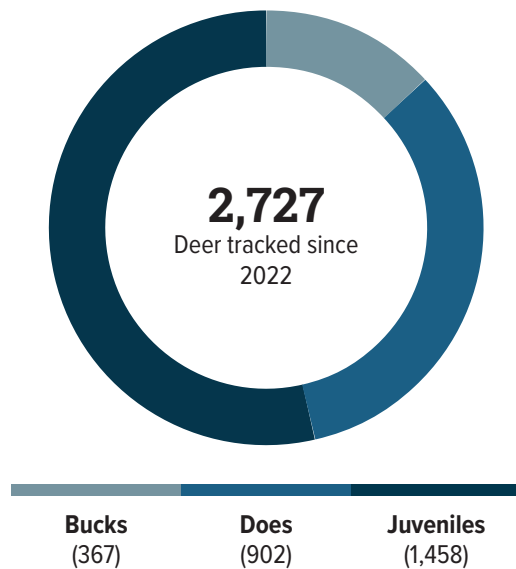Disease assessments.

Updated abundance estimates.

Current data that's accurate and immediately available.

Assessments of survival, movement and habitat use.

QUICK FACTS

2,727
Deer tracked since 2022

Bucks
(367)

Does
(902)

Juveniles
(1,458)

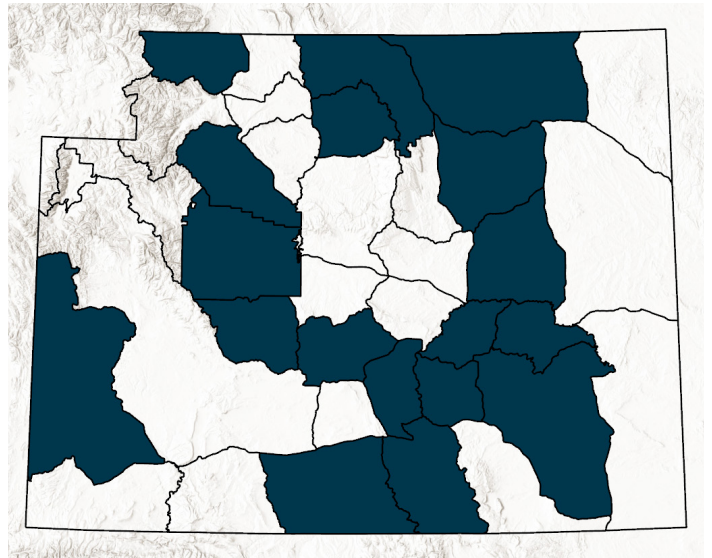**7.6 MILLION**
Total GPS data points

500
Individual migrations analyzed

PROJECT ACTIVITIES

ABUNDANCE

Knowing how many animals are in a population is a cornerstone of wildlife management. Yet it can be nearly impossible to count every mule deer, especially given the complexity of Wyoming's landscapes. Using state-of-the-art aerial surveys, managers have collected robust data on deer numbers in 19 herds since the beginning of the Mule Deer Monitoring Program. While the department surveyed herds using this approach in the past, limited funding allowed for only one herd to be sampled each year. Support from the Mule Deer Monitoring Program, along with some innovations in survey design, have dramatically accelerated this pace. These data help the department better understand population trends and the effects of ongoing management strategies. Managers hope to survey nearly all mule deer herds in the state by the time the program ends in 2027.
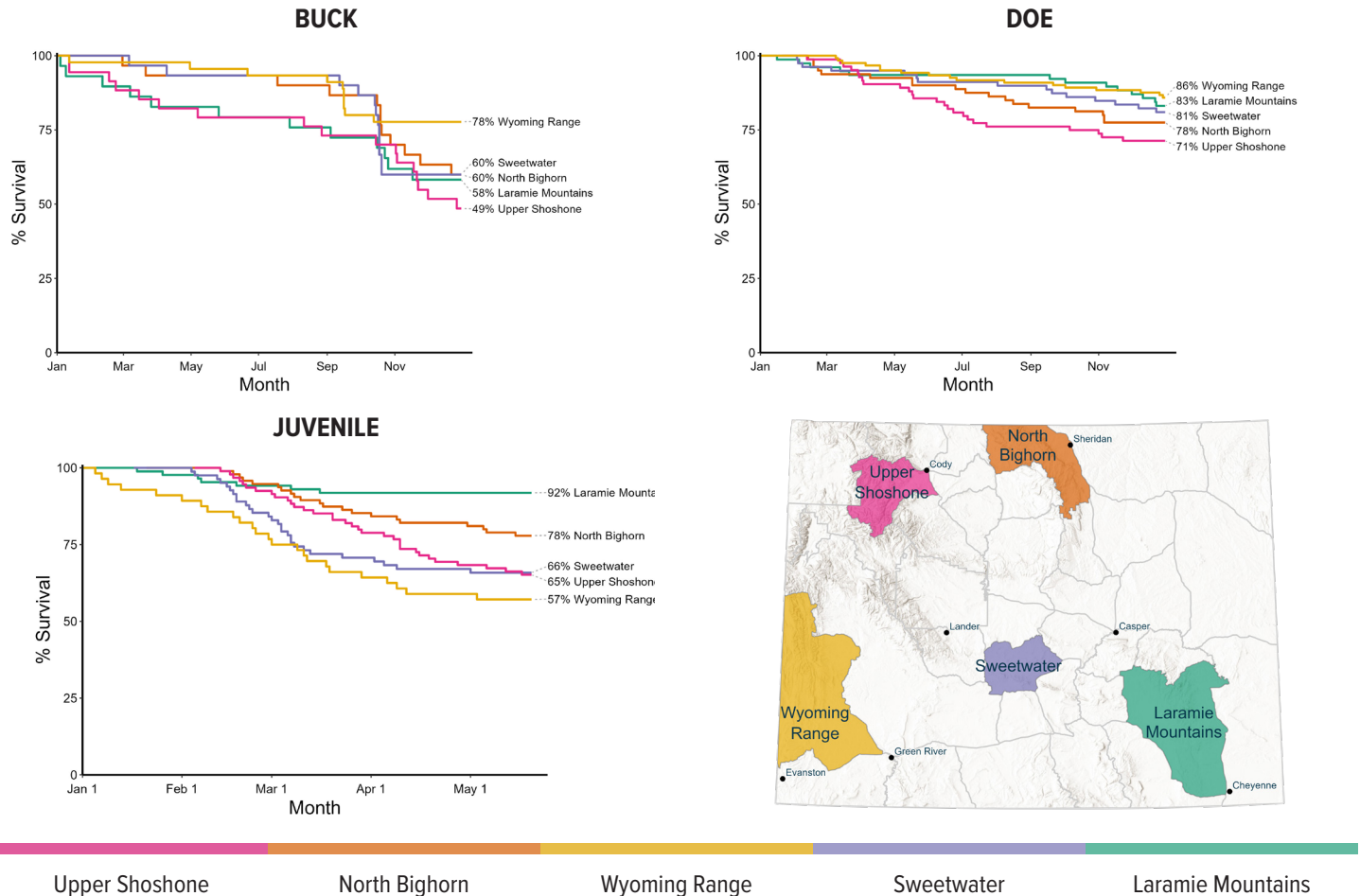

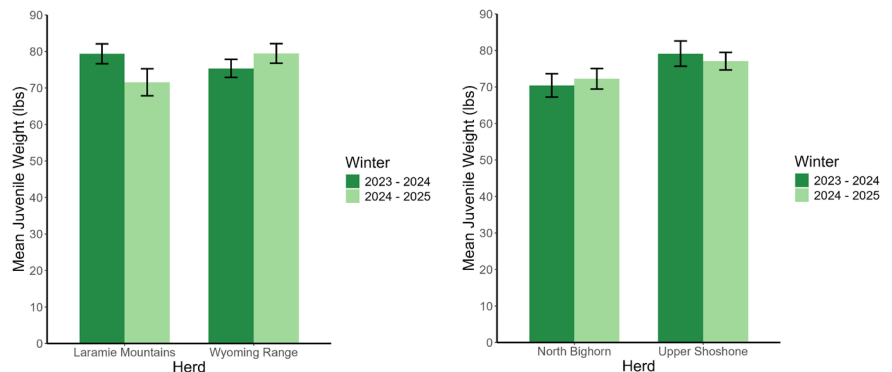Herds where abundance surveys have been conducted since 2022.

SURVIVAL

Not surprisingly, survival influences the total number of mule deer in a population. Over the last two years, managers have deployed GPS collars on deer in five focus herds to measure where, why and how well deer survive. The five herds are located in different parts of the state, which helps managers understand how deer make a living amidst different weather conditions, predator communities, diseases and habitats.

Each year the department monitors 80 does, 30 bucks and 100 juveniles (more than 6-month old deer) in each herd. Since the beginning of the program over 2,700 animals have been enrolled in the project, making it one of the largest mule deer studies undertaken in North America. Data from these animals paint a detailed picture of what it takes to survive in Wyoming. Armed with this new information, department personnel are putting strategic management actions in place to help address barriers to survival.

BUCK

78% Wyoming Range
60% Sweetwater
60% North Bighorn
58% Laramie Mountains
49% Upper Shoshone

DOE

86% Wyoming Range
83% Laramie Mountains
81% Sweetwater
78% North Bighorn
71% Upper Shoshone

JUVENILE

92% Laramie Mountains
78% North Bighorn
66% Sweetwater
65% Upper Shoshone
57% Wyoming Range

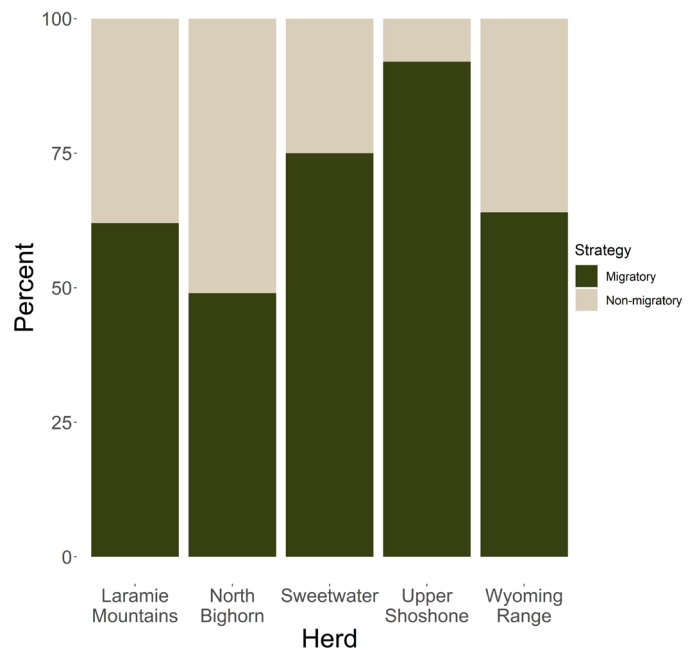Upper Shoshone   North Bighorn   Wyoming Range   Sweetwater   Laramie Mountains

Life can be difficult for juvenile mule deer, especially as winter approaches. In many cases, they are moving from well-known summer habitats to unfamiliar winter habitats, coping with snowfall and cold temperatures, getting by on limited food, all while growing into adulthood. Bigger juveniles, usually those coming into winter with more body mass, tend to survive better. Starting in fall 2023, managers began weighing 40 juveniles selected at random from each of the five focus herds. These data will help managers understand how juvenile weights compare both across the state, and across years with very different winter conditions.

Juveniles caught within the same 16-day period are included in comparisons.
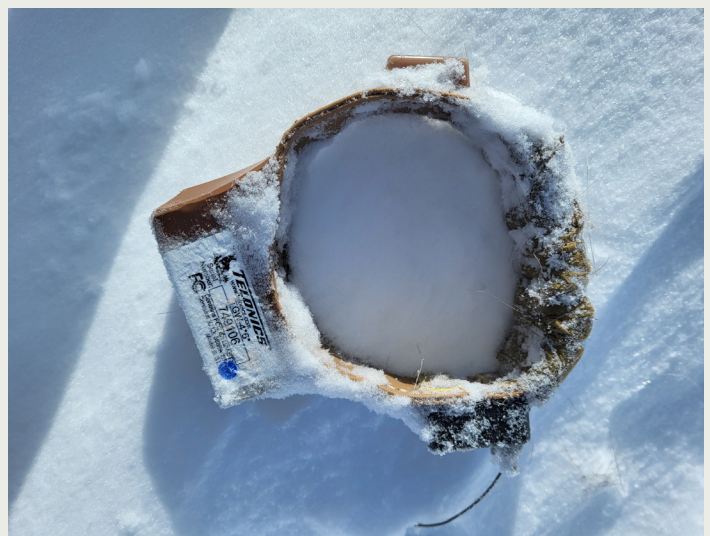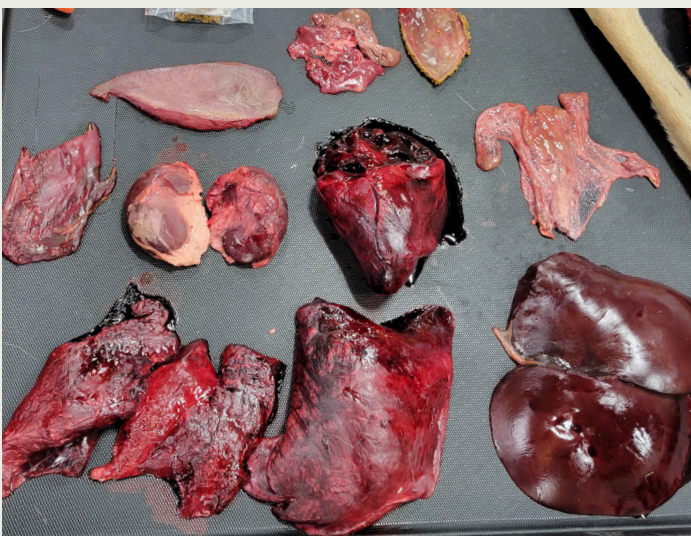
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MOVEMENT

Movement helps animals secure food, avoid harsh weather and escape risks. When it comes to mule deer, movement between seasonal ranges, away from deep snow or out of a predator's reach can mean the difference between life and death. Not surprisingly, animals deal with the need to move in different ways. Animals that migrate long distances between summer and winter ranges may get to the best food in the summer, but it will require a lot of work and energy. Non-migratory or short-distance movers can use less energy, but may miss out on the best summer resources. The department, in collaboration with a student-researcher at the University of Wyoming, examined movement strategies among 500 animals. Subsequent analyses will focus on measuring the characteristics of each movement strategy along with corresponding implications for individual survival.

CAUSE OF MORTALITY

While the capacity to move between habitats can go a long way towards ensuring survival, mule deer face numerous challenges. Among these are malnutrition, disease, vehicle collisions, predation and accidents such as falling through ice or tumbling off a cliff. Definitive mortality data can be difficult to collect. It requires racing the clock to get to a carcass before scavengers do, and hoping sufficient evidence is left behind to clearly determine why an animal died. Managers have recorded causes of death for nearly 200 GPS collared individuals. Continued progress on this aspect of the project will allow the department to better measure the primary drivers of mortality, determine if or how these drivers change across years with different climate conditions and assess appropriate management actions.

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NEW TECHNOLOGY

This past winter, managers fit 25 adult females with GPS collars equipped with video cameras in collaboration with the US Geological Survey. These collars were deployed on animals in the Laramie Mountains, North Bighorn, Sweetwater and Upper Shoshone herds. The addition of video data will allow the department to better assess how collared deer interact with the landscape and with other deer. Specifically, this initiative provides a lens into how often deer interact with one another – something that cannot be determined from location data. Understanding how frequently deer are in contact can shed light on disease transmission, including the potential spread of chronic wasting disease. Furthermore, video data also may help personnel confirm individual cause of death in cases where little physical evidence remains at a mortality site. Video-equipped collars will be deployed for one year, automatically releasing from animals in winter 2025-26.

Photos courtesy of Paul Cross.

ELK HARVEST MANAGEMENT

Expanding elk populations have caused concern about the effects on mule deer. Department staff worked closely with private landowners in southeast Wyoming to initiate a project that examines how targeted reductions in elk impact mule deer distribution and habitat use. In February 2024, 120 cow elk were marked with GPS collars, 60 each in elk Hunt Areas 6 and 7. These hunt areas overlap the Laramie Mountains mule deer herd, where mule deer also are collared. Managers will use data from this project to measure how ongoing efforts to substantially reduce elk numbers in these areas affect mule deer. Collared elk also will help managers learn about the formation and behavior of large wintering groups of elk, and specific management tools that can influence elk vulnerability to harvest.

NEXT STEPS

As 2025 progresses, we will turn our attention to summer data collection, which includes measurements of forage quality on summer habitats and continued work on mortality investigations. We will begin our fourth round of captures in November 2025.

PARTNERS