# MULE DEER MONITORING PROGRAM

INVESTING IN THE FUTURE OF WYOMING'S HERDS

# 2023 ANNUAL REPORT

## OVERVIEW

The Wyoming Game and Fish Department's Mule Deer Monitoring Program provides actionable information for improved wildlife management based on a better understanding of how many deer there are, their health, herd structure/composition and better data regarding harvest and public values. The program began in fall of 2022 and is scheduled to operate for five years and will provide:

- 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

**1081**
Deer tracked in 2023.

**Bucks** (162) **Does** (444) **Juveniles** (475)

**57**
Deer hunt areas containing deer locations.

(47%)

**7**
of 8 Game and Fish regions enrolled.

**2,749,406**
GPS data points.

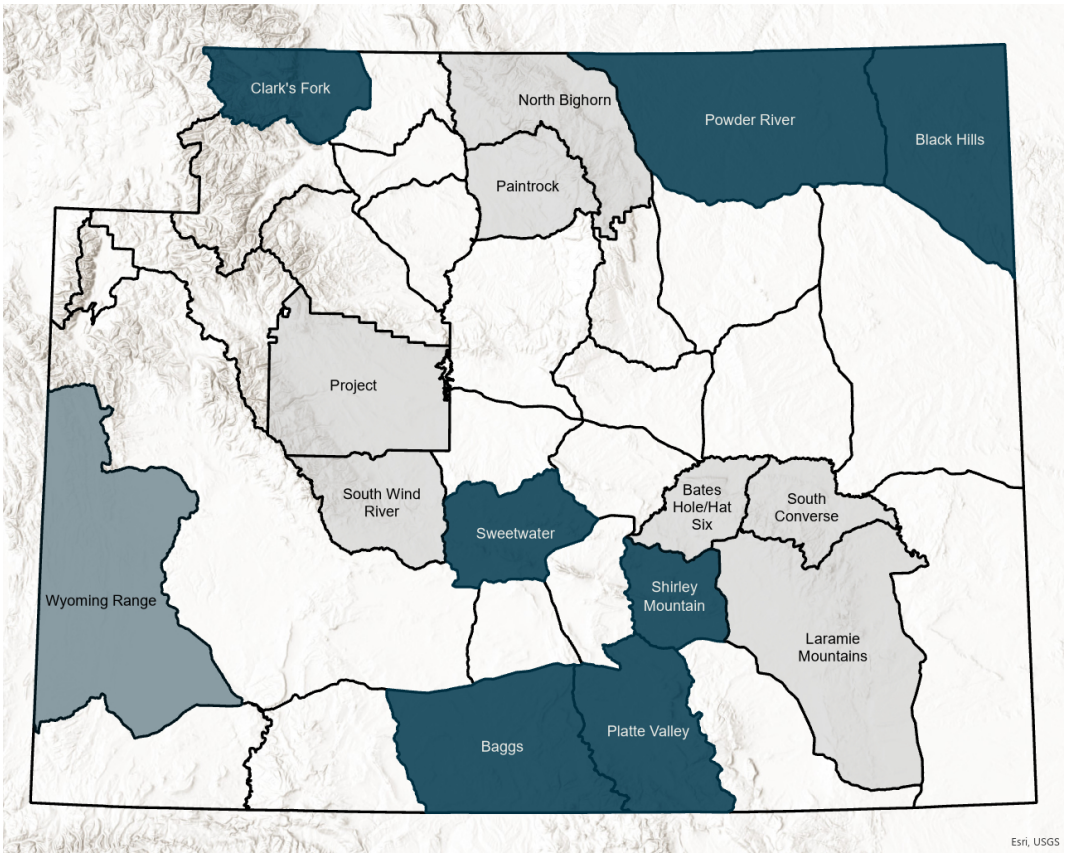
**32**
deer captured per day on average during captures.

**241,176**
Deer-monitoring-days.

# PROJECT ACTIVITIES

## RELIABLE INFORMATION ON HERD SIZE

Knowing how many animals are in a herd is a cornerstone of management. Yet, Wyoming's landscapes are complex, and it is difficult to count every deer. Abundance surveys deliver reliable information on how many deer are in a herd. Over the past two winters, managers conducted surveys in 16 herds. Historically, the Department would have completed this sort of survey in only two herds over this same timeframe. Survey information informs better management strategies and contributes to more robust population models.




Surveyed winter of 2022-23 and 2023-24

Surveyed winter of 2022-23

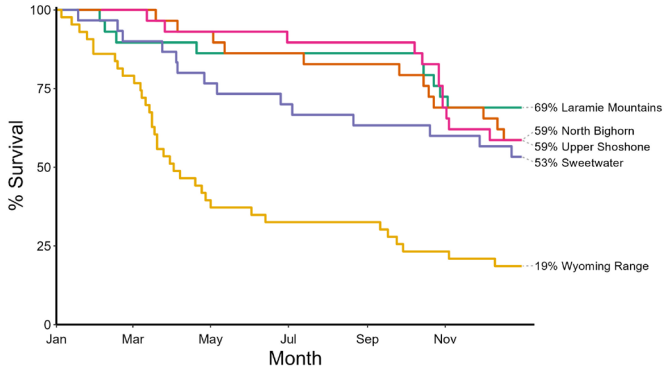
Surveyed winter of 2023-24

## SURVIVAL

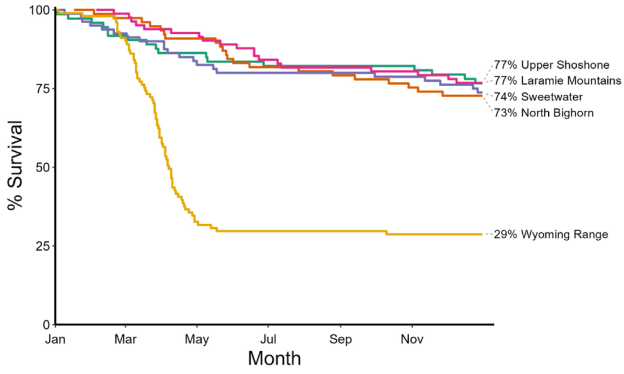
At the outset of the program, managers identified five herds for intensive study. In these herds, Department personnel monitor doe, buck and juvenile (greather than six months old) survival using GPS collars. Herds are located in different parts of the state to encompass important differences in habitat, disease and predators. Managers use the information from marked animals to measure herd growth, assess causes of mortality, evaluate harvest strategies, update maps of seasonal ranges and more.

Starting in November 2022, the Department fit a little more than 1,000 deer with GPS collars – approximately 80 does, 30 bucks and 100 juveniles in each herd. Over the following months biologists monitored how well these animals survived, when and where they lived each season and how they moved between seasonal ranges.

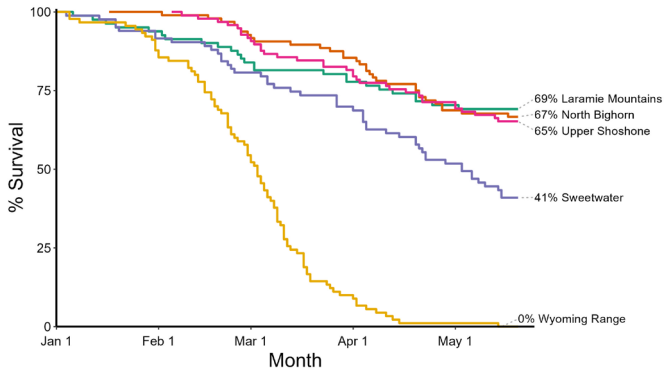
### BUCK

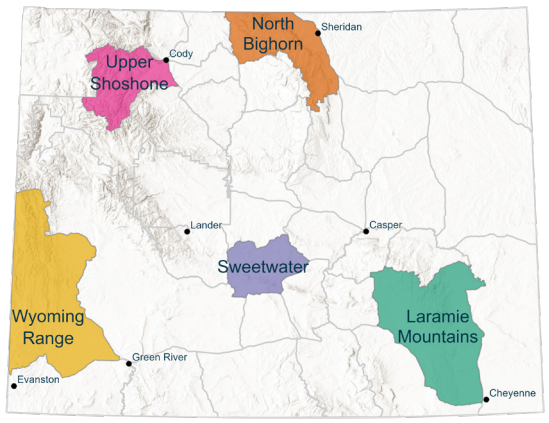



### DOE




### JUVENILE



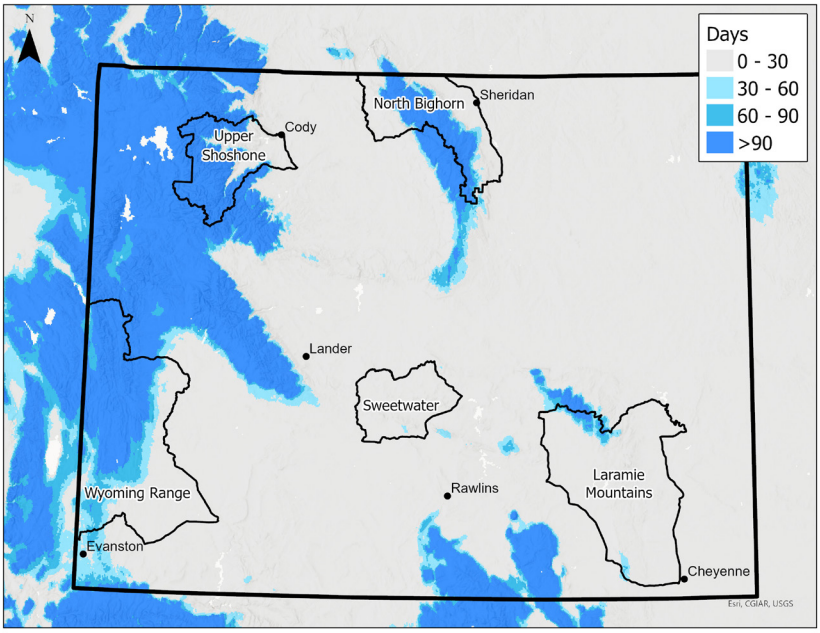




Upper Shoshone | North Bighorn | Wyoming Range | Sweetwater | Laramie Mountains

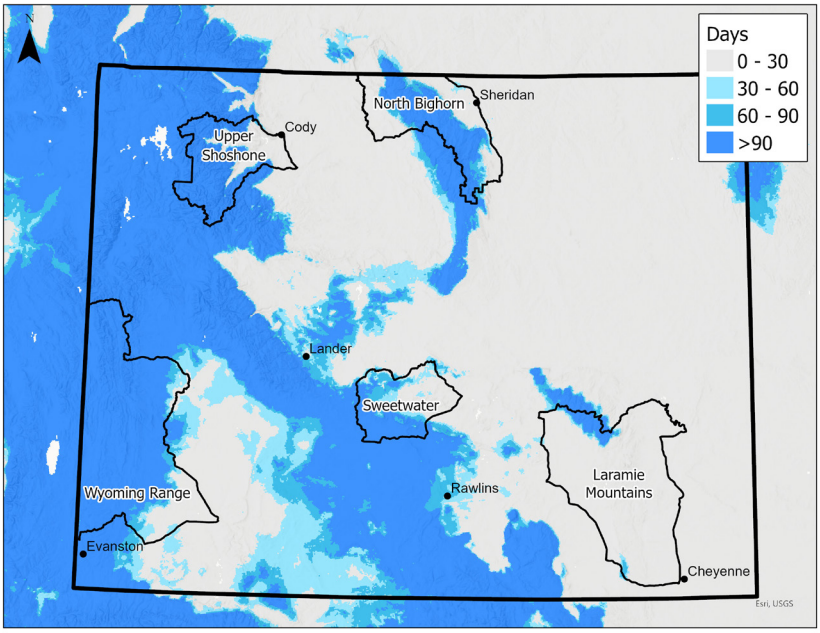
Survival varied notably between herds and the conditions that they experienced. The 2022-23 winter brought above-average snowfall in parts of the west and center of the state (shown in figures below). In these areas, snow cover limited access to food and increased the energetic costs of travel. Animals unable to secure enough food to meet energetic demands died, leading to high mortality rates, especially among juveniles. Deer in parts of the state with more normal winter conditions faced a less costly environment and had higher survival. For example, in the Laramie Mountains, North Bighorn and Upper Shoshone herds, juvenile survival surpassed 65%, which was higher than the long-term average in nearby Idaho 1998-2011, Idaho Fish & Game). Beyond winter, other causes of mortality included predation, CWD and vehicle collisions.

## AVERAGE DAYS WITH > 1' OF SNOW

**Average days with > 1' of snow in a typical year**
December 1 - May 31 on average from 2003 - 2022

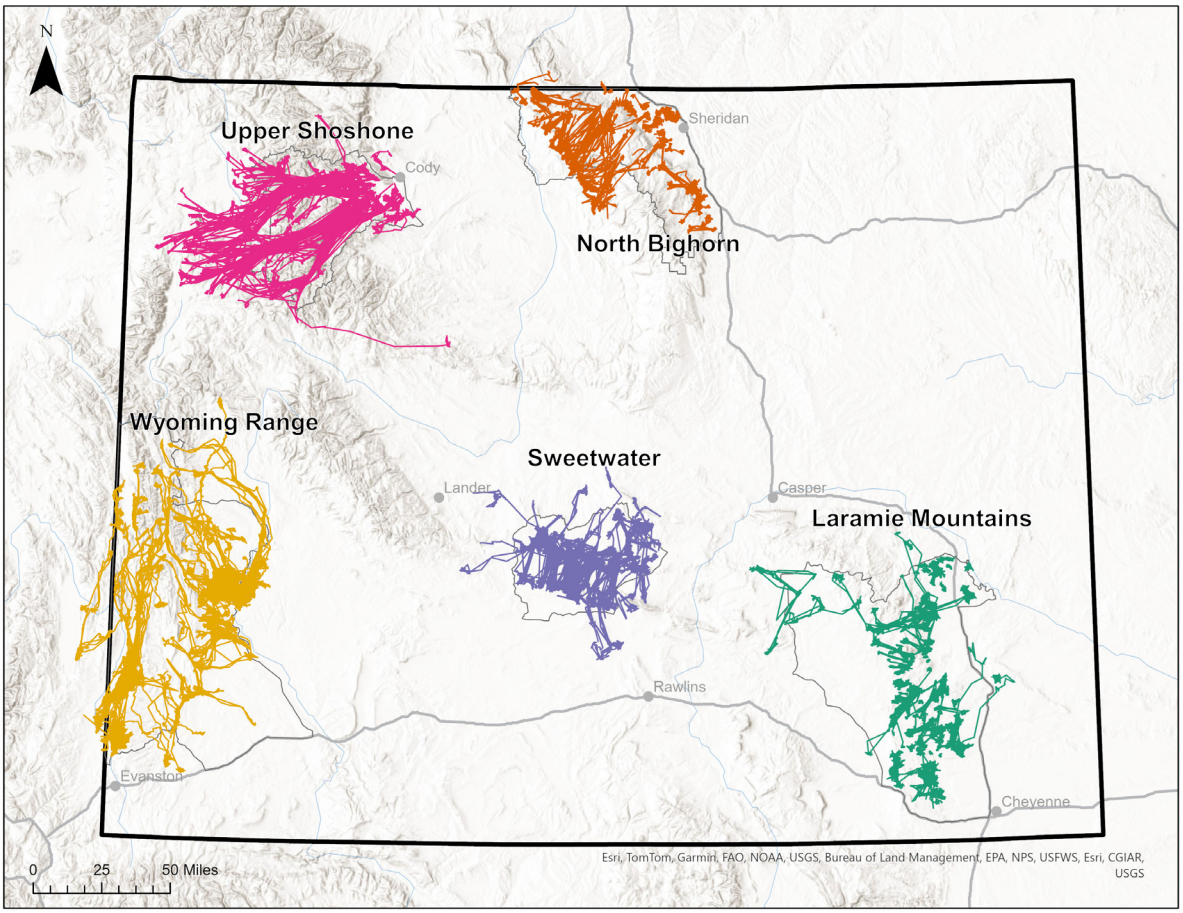



**Average days with > 1' of snow last year**
December 1, 2022 - May 31, 2023



## MOVEMENT

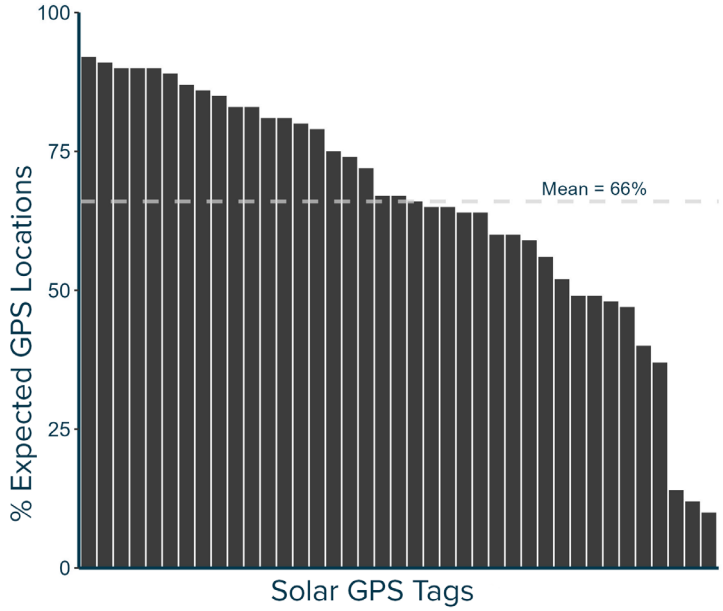
Animals employed vastly different movement strategies both within and between herds. In Upper Shoshone, for example, marked deer moved 80 miles or more between winter ranges near Cody, and summer habitats in Grand Teton National Park. In contrast, many deer on the east side of the Bighorns stayed closer to home year-round, surviving on locally available resources. The Wyoming Range is a herd known for lengthy migrations. Deer 2899, however, lives on the west side of the herd and had a different idea. She traveled just 5 miles between winter and summer ranges. Her short-distance movement highlights multiple movement strategies within a herd, and the potential benefits this may offer for dealing with highly variable environmental conditions. Continued information on movement will help managers better understand potential disease transmission risks, variation in habitat use across herds and the diversity of movement strategies within each herd.



## NEW TECHNOLOGY

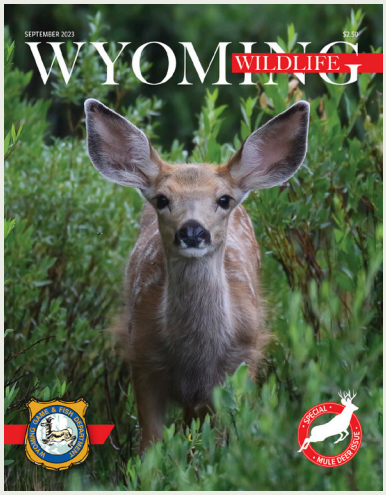
Forty animals enrolled in the study also were equipped with a solar-powered GPS ear tag (tags). The tags offer an alternative to expandable collars and have proven effective during an ongoing pilot study at the Department's Tom Thorne /Beth Williams Wildlife Research Center. Department personnel fit 10 adults each in the Sweetwater herd and Upper Shoshone herd with a solar ear tag and a GPS collar. This approach allows personnel to evaluate the quality and performance of the tags relative to traditional collar technology. Biologists placed the remaining 20 tags on juveniles, without a paired collar. Tags deployed on juveniles will provide critical information on the suitability of the technology for young, growing animals – the cohort for which the Department would like to deploy the tags at a large scale in subsequent years.

Preliminary analyses suggest the solar tags performed reasonably well during the first year of testing. Across all units the average fix success was 66% (shown in the figure). Tags collected more locations in summer, when longer daylight periods likely maintained a stronger battery charge. Managers saw a mean distance between the paired solar ear tag and GPS collar locations of 18.7 m. Note, however, that the number of animals for which we have conducted this analysis is small, as it requires the entirety of the data on a GPS collar, which biologists receive only after an animal dies or the collar releases.




## OUTREACH AND EDUCATION

*Wyoming Wildlife* magazine released a special issue about mule deer in September 2023. The magazine increased the number of pages from 48 to 60 to cover as much about mule deer as possible. Articles informed readers about mule deer hunting, challenges faced by mule deer and wildlife managers, chronic wasting disease, the Mule Deer Monitoring Program, ecology, habitat, migration and more, plus it included activities for kids. The issue also included a fold-out map showing the movements of five mule deer from five focal herds. The special issue was mailed to more than 22,000 individual subscribers and continues to be distributed at events throughout the state. The special issue won several awards for written and visual elements.



# NEXT STEPS

In November 2023 we began the second season of captures associated with the project. During this season we focused on marking animals to replace those that died during the previous year, or those whose collars had dropped (juveniles). This is a critical step to maintaining sample sizes and therefore answering the questions that the study is designed to address. Captures wrapped up in late January, with a new round of data already coming in to help managers better understand the state's herds.