



# March 2015 Snowy Range Moose Capture

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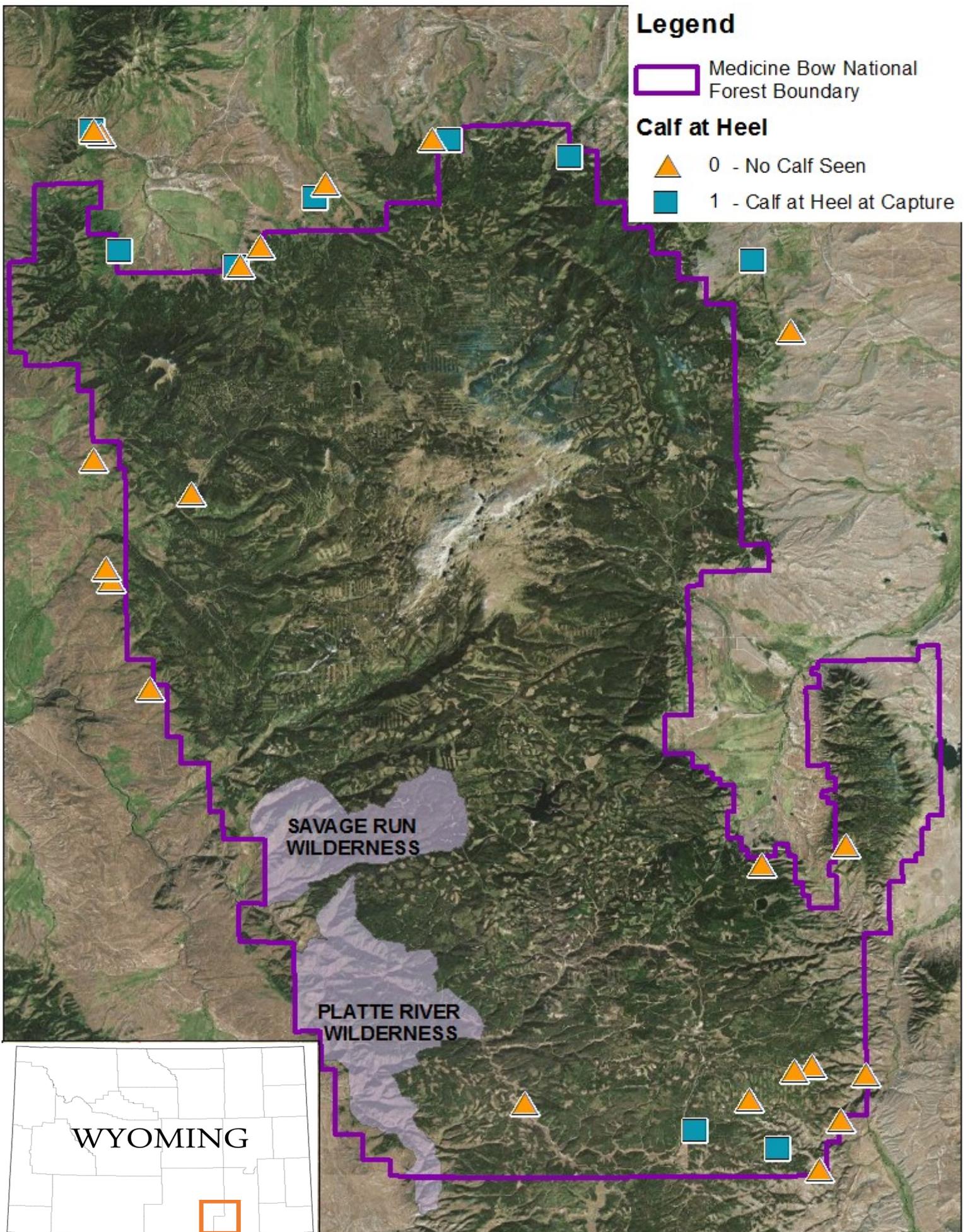
Shiras moose have seen declines in recent decades across much of their statewide range due to a multitude of factors. The Snowy Range herd, which colonized the area following an introduction into North Park Colorado in the 1970s, is thought to be robust to these changes. Relatively new, lacking wolves or grizzly bears, and with liberal human harvest, the Snowy Range herd may be free of density-dependent pressures and existing as a small but highly productive population.

Despite the impressions of stable population performance, the landscape of the Snowy Range has been altered dramatically by the mountain pine beetle, and the moose herd has not been studied since 2006. Moreover, effects of pine beetle outbreak on large mammals are almost entirely unknown. A new collaborative study initiated in fall 2014 by the Wyoming Cooperative Fish and Wildlife Research Unit and the Wyoming Game and Fish Department presents an excellent opportunity to examine the relationship between moose habitat use and seral changes brought about by bark beetles. By making use of an existing GPS dataset collected prior to extensive beetle damage (Baigas 2008), comparing it to new GPS data, and examining current individual movement strategies through the lens of body condition, this project will provide new information on the status of moose in the Snowy Range and their response to its beetle-killed forests.

The project began its field component this March; 30 female moose (29 adults and one yearling) were captured via helicopter darting on winter habitats within and surrounding the Medicine Bow National Forest. Moose were fitted with GPS store-on-board collars set to collect 90-minute fixes. The fix-rate is identical to that used in the previous study, which will allow us to compare movement strategies and space use of moose prior to and following the extensive bark beetle damage. Collars will remain deployed for a period of two years, during which study animals will be recaptured twice per year to gather longitudinal data on demography and body condition (measured via ultrasonography). Monitoring body condition in the context of pregnancy (during winter) and lactation costs (in summer) will allow the project to critically examine the habitat quality of the Snowy Range, with the goal of understanding where the herd sits relative to nutritional carrying capacity.



**Figure 1:** A soon-to-be-collared moose flees from Quicksilver Air's R44 helicopter.

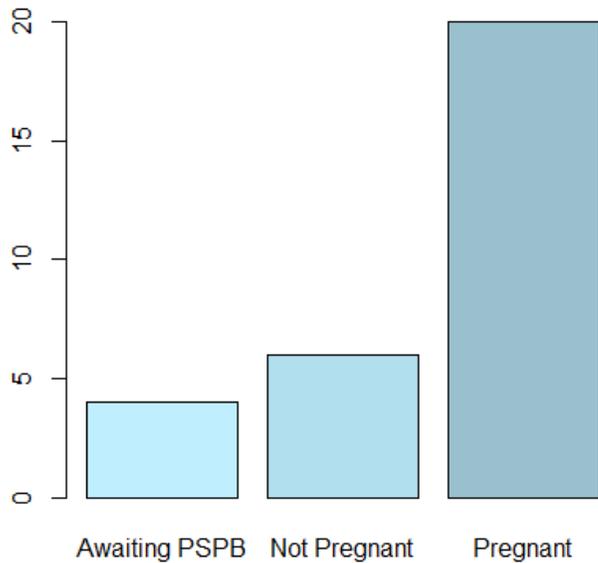


**Figure 2:** March 2015 moose capture locations. All captures were of new un-collared females (29 adults, 1 yearling).



Moose were fit with ATS store-on-board GPS collars. Collars will collect 90 minute fixes for two years. VHF beacons are turned off for most of the year to conserve battery. This is excepted during capture periods (March and early December) and calf recruitment monitoring periods (weeks 1 and 2 of July, week 4 of August, and week 1 of September). Collars will transmit a mortality signal regardless of time of year and will be re-deployed on a new female in the event of animal mortality during the study. All collars feature a white band and a colored tag on either side of the battery pack. Each tag has a unique color and number combination; if numbers wear off, moose can be individually identified by noting the tag color on both sides.

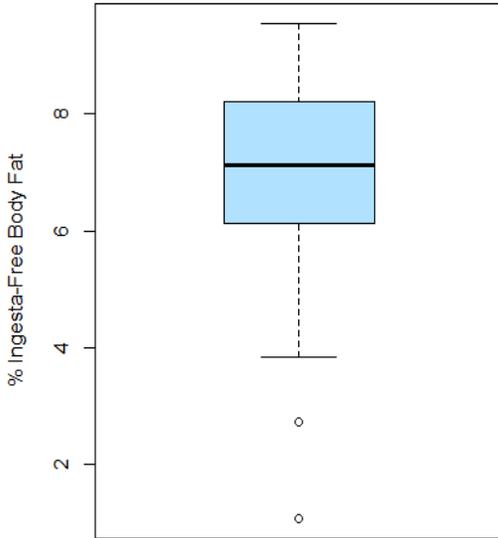
### Pregnancy



Most females were pregnant (n=20) and few were not (n=6). Pregnancy was determined via trans-rectal ultrasonography; we are awaiting PSPB blood test results to make a final determination on the remaining females (n=4), though it is likely that these were also pregnant. Pregnancy will be measured again during December recaptures.

Few females had a calf at heel during capture (n=9) compared to those that did not (n=21). This pattern may change during recaptures, as the helicopter will be directly targeting individuals and not searching areas for females. Calf at heel will be determined for collared cows twice during the summer and again during each recapture.

## Body Fat

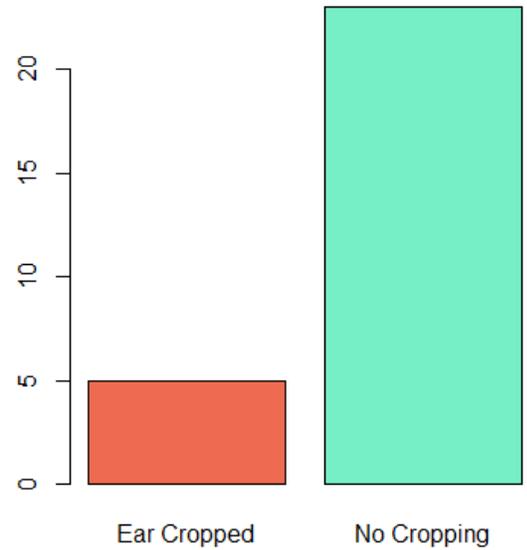


Assessing longitudinal trends in body condition as a function of habitat selection and reproduction is a crucial component of this project. Measuring percent body fat through ultrasonography is an informative method to determine nutritional condition. Mean % body fat during captures was 6.7, slightly higher than the four year average (6.1%) of the Sublette moose study (measured 3 weeks earlier on average).

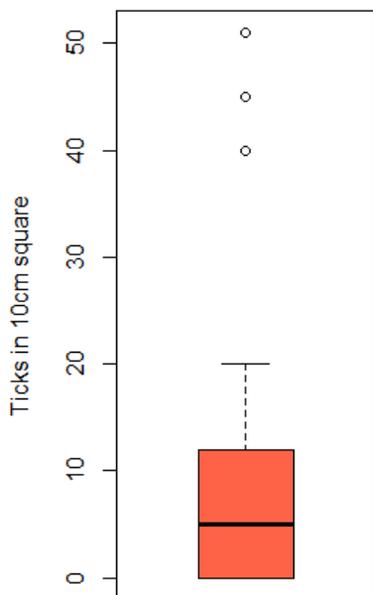


*Elaeophera* arterial worms may negatively impact moose populations with warming climates and increased white tailed deer abundance. We noted the presence of ear-cropping, a clinical presentation of *Elaeophera* infection, and will continue to track both presence and severity of ear cropping during subsequent recaptures. Blood is collected and banked in the event that an antemortem test is validated for moose.

## Ear Cropping



## Tick Transect



Winter ticks are of increasing concern to moose managers. Tick load was approximated by counting ticks within a 10cm<sup>2</sup> area on the shoulder blade; a method adapted from researchers in New England. Results were mixed, as characteristic hair loss begins later in the year. Furthermore, ticks were highly varied in their life stage; sub-adult ticks were significantly smaller and far more difficult to detect in dense hair. Median ticks/10cm<sup>2</sup> was 5 ( $\mu=10$ ); many moose had no detectable ticks, though one had over 50. We will continue using this method until a better alternative is devised. Another researcher at the University of Wyoming is identifying species of ticks collected from project moose and studying their thermal tolerance.



# Acknowledgments

Research is funded by the Wyoming Game and Fish Department and the Wyoming Governor's Big Game License Coalition. We are grateful to Laramie Region WGFD personnel for their knowledge of moose winter range, logistical support, landowner contacts, and for conducting a spotter flight to facilitate capture operations. We are deeply indebted to private landowners around the Medicine Bow National Forest; without their consent the capture may well have been a failure (27% of the study animals were captured on private land). Moose were also captured on public lands administered by the USFS, BLM, and State of Wyoming.

