Mule Deer Survival in the Bitterroot Valley

Progress Report - Spring 2016

In winter 2015-2016, Montana Fish, Wildlife and Parks (MFWP), in collaboration with MPG Ranch, initiated a pilot study to estimate adult female mule deer survival and to identify the sources of mortality in the northern and southern Bitterroot Valley. Additionally, this work will provide baseline information on mule deer diet, mule deer health and condition, and spatial overlap with elk.

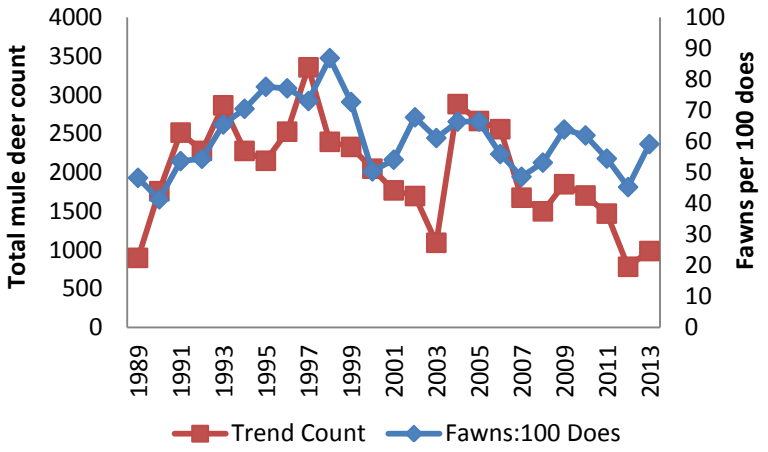

Figure 1. The number of mule deer counted and the number of fawns per 100 does counted in the southern Bitterroot survey area (HD 270) from 1989 - 2014.

Project Background

Mule deer populations have recently declined in parts of Montana and portions of the northwestern United States. Biologists observed similar broad, regional declines in mule deer populations in the late 1960s, the late 1970s, and again in the early and mid 1990s, yet the complex combination of factors that drive these regional mule deer population fluctuations is not well understood. Potential causes include habitat loss or degradation, intraspecific competition, predation, disease, and/or interspecific competition (i.e. with elk and livestock). Recent intensive research efforts in Colorado and Idaho have broadly concluded that mule deer populations are limited by habitat, specifically by winter range habitat and weather that may limit the overwinter survival of fawns (Hurley et al. 2014, Monteith et al. 2014, Bergman et al. 2015). How these results translate to western Montana is unknown however, as variations weather and predator communities may have variable effects on mule deer populations. For example, mule deer numbers have declined in the Bitterroot Valley of western Montana, but survey data do not support the hypothesis that reduced fawn survival is a driving factor (Figure 1). The cause of mule deer declines in the Bitterroot Valley is unknown and the purpose of this project is to evaluate adult female survival and better understand the factors that may be contributing to population declines.

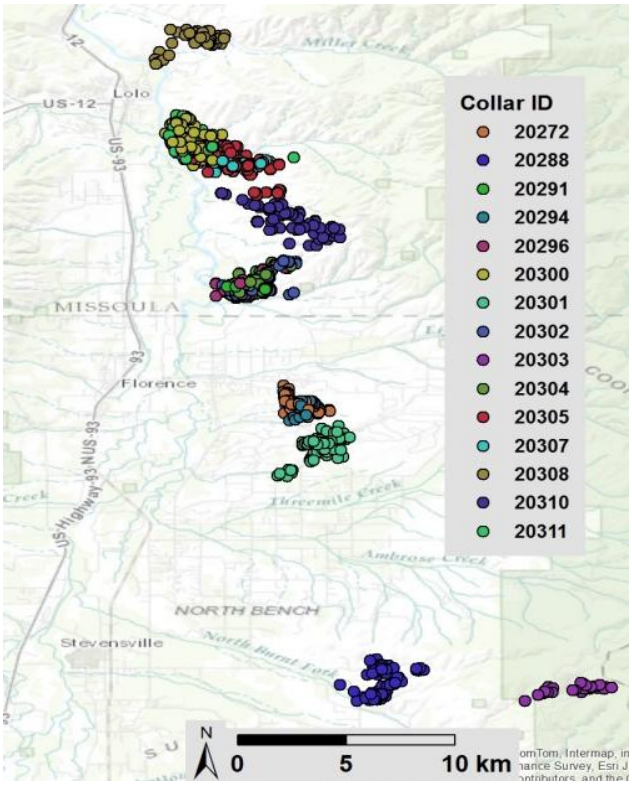

Figure 2. Locations from adult female mule deer in the Sapphire area of the Bitterroot Valley from March 1 through March 16, 2016.

Deer Monitoring and Survival

During winter 2015-2016 we ground darted 33 adult female mule deer. We collected blood and fecal samples, measured chest girth, estimated age based on tooth wear patterns, assessed body condition by palpation of the ilium, ischium, sacral ridge and sacro-sciatic ligament, and noted the presence of fawns (Cook et al. 2007). We instrumented each doe with a radiocollar programmed to collect a GPS location every 4 hours and send a mortality signal if the collar becomes inactive for 8-hours, and applied ear tags for future identification. We captured and sampled a total of 17 mule deer on the Northern Sapphire winter range (Hunting District [HD] 204) and 16 mule deer on the East Fork winter range (HD 270).

Figure 3. FWP Area Biologist and project volunteer prepare to release an adult female deer.

As of May 10th we investigated 5 mortality events: 3 in the Northern Sapphire area and 2 in the East Fork area. Mortalities in the Northern Sapphire area and included 1 coyote depredation, 1 unknown mortality, and 1 capture related mortality. The mortalities in the East Fork area included one lion depredation and 1 natural mortality. The deer that died of natural mortality was found intact with no sign of injury, predation or scavenging, and given the time of year and condition of the carcass the deer likely died of poor condition (i.e., winter kill).

Deer Age, Body Condition, Pregnancy and Disease Exposure

We estimated captured mule deer to be from 1.5 to 10+ years of age. We estimated 16 out of 33 animals to be 1.5 – 2.5 years old, and 10 out of 32 animals to be 6.5 or older. We will send an incisor from all mortalities to Matson's Laboratory for aging by cementum analysis.

Figure 4. An adult female mule deer waking up after being immobilized and instrumented with a radiocollar.

Based on palpation, we observed deer were generally in poor condition (i.e. little to no discernible body fat at any points of palpation). Additionally, while our sample size was limited to 8 animals, we found only 2 deer to have measurable layers of rump fat when assessed using ultrasonography.

We collected blood samples to determine pregnancy and to screen for exposure to diseases (bluetongue, epizootic hemorrhagic disease, and bovine respiratory syncytial virus) as well as livestock diseases (parainfluenza 3, bovine viral diarrhea, leptospirosis, and anaplasmosis). We collected blood samples from 28 of the 33 mule deer. We also collected fecal samples from all captured mule deer to screen for parasites and to assess winter diet composition.

We found pregnancy rates of 94% in the Northern Sapphire area and 92% in the East Fork area. These rates are similar to other mule deer populations in eastern Montana, Colorado, Idaho, and Utah where pregnancy rates range from 86 – 100% (Wood et al. 1989, Andelt et al. 2004, Hurley et al. 2011, Freeman et al. 2014).

Serology and diet results are pending, and will be included in future reports.

Timeline

Radiocollars will collect location data and survival will be monitored for 3 years. During spring and summer 2016, mule deer pellet samples will be collected to assess spring and summer diet.

Acknowledgements

We thank the organizations and individuals that have provided financial support for this project: Montana Outdoor Leadership Foundation, the MPG Ranch, Rocky Mountain Elk Foundation, Mule Deer Foundation, and the Ravalli County Fish and Wildlife Association. We thank the Idaho Department of Fish and Game for the use of collapsible clover traps. And we thank the various landowners that have granted us access for fieldwork and provided logistical support.

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