

Upper Arkansas River¹ Predator Management Plan Overview



ADDRESSING COUGAR PREDATION ON MULE DEER IN DATA ANALYSIS UNITS D-16 AND D-34

The recently adopted Colorado mule deer strategy identifies predation as one of the potential factors limiting Colorado mule deer populations. Since the adoption of the mule deer strategy by the Parks and Wildlife Commission, CPW developed a plan for the implementation of the strategy. As part of the implementation strategy, staff examined existing predator and deer research and monitoring data to identify areas where predation may be most limiting to mule deer, which in turn could be used to inform predator harvest/management decisions. In June 2015, CPW personnel met to explore the concept for a project that examines how deer populations may respond to cougar suppression.

Deer data analysis unit (DAU) D-16 (Figure 1) was identified as an area where cougar suppression could be beneficial to the deer population. Beginning in 1999, D-16 was added as one of 5 intensive deer monitoring DAUs in the state. From 1999-present, averaging across all years, the leading known cause of both doe (6.4%) and fawn (7.5%) mortality has been cougar predation. Cougar predation has averaged 28% of the total mortality for does and 32% of the total mortality for fawns. Currently, the population is below the long-term population objective (current objective 16,000-20,000 deer) and based on survival data, population growth may be limited to some extent by cougar predation on fawns and adult does.

A research project is proposed, beginning in the winter of 2016/2017, to examine the mule deer population response to cougar suppression. The study would be conducted in D-16 and the adjacent DAU, D-34. Harvest levels in these two DAUs would be used to create different cougar densities to examine the effects of cougar suppression in three stages. In stage one (years 1-3), cougar populations in D-16 will be suppressed (~50% harvest and human caused mortality), while cougar populations in D-34 will be allowed to increase towards habitat potential (~10% harvest). Stage 2 (years 4-6) represents a recovery stage where both populations will be allowed to increase towards habitat potential (10% harvest). The final stage (years 7-9) represents the crossover where D-34 cougar populations will be suppressed (~50% harvest and human caused mortality), while D-16 will continue to be allowed to increase towards habitat potential (~10% harvest).

CPW believes this is the first study that will examine the mule deer response to cougar population density in such a controlled experiment with significantly different cougar densities. These two disparate cougar densities should result in significantly different levels of predation mortality and an understanding of how predation impacts survival within the mule deer population. Through this manipulation we will also gain a better understanding of cougar harvest management and potential impacts on cougar populations.

The impact of cougar hunting on cougar populations, especially high levels designed to suppress populations, can be varied and is not well understood. A Wyoming study demonstrated that a cougar population could be significantly suppressed through 2 years of heavy harvest. Harvest rates of approximately 12% to 18% of the population have generally been shown as the tipping point between maintaining stable populations and decreasing populations. However, the percent adult female harvest is the crucial factor in population change. Understanding harvest structure as populations are manipulated throughout the experiment will provide critical information for management in the future as decisions are made about suppressing, maintaining or increasing cougar populations.

One aspect of this study will be to closely examine cause-specific mortality of cougars and develop a thorough understanding of levels of mortality in relation to population size and hunting pressure. The progression of this study will enable us to directly measure cause-specific survival during declining and increasing phases of a cougar population and under heavy and light harvest scenarios. This will allow a clear examination of non-hunting mortality rates, such as disease, intra-specific strife, or other natural mortality.

Similarly, cause-specific survival of kittens throughout the stages of the project will provide essential information for management as this directly relates to population growth and recovery. Past research has suggested that increased harvest has actually led to decreased kitten survival because of infanticide (kittens being killed by other cougars). Increased infanticide has been suggested to relate to high male harvest as this leads to an increase in subadult males in the population and territorial instability. However, recent cougar research in Colorado has shown higher infanticide rates during a 5-year non-hunting period than the subsequent 5-year hunting phase of the study.

There is also the perception that high immigration rates of subadult males will lead to increases in human conflict and livestock depredation. Some studies have indicated that harvest and subsequent increases in subadult males have correlated with human-cougar conflict. However, others have found that demographic class did not relate to human-cougar interaction. This management experiment will provide direct information on human-cougar interactions with respect to changes in cougar populations, age structure, and immigration rates.

The objectives of this study are first to evaluate the effects of cougar population density on mule deer populations. In conjunction with this, CPW hopes to evaluate the effectiveness of sport hunting to achieve high rates of cougar harvest. In addition to evaluating the mule deer response, we will also examine the structure of the cougar harvest and the cougar population responses to harvest levels. Cougar demographic rates (cause-specific mortality, reproduction, immigration/emigration) will be estimated relative to population density and harvest level.

CPW is proposing this research project to examine deer population response to changes in cougar density to gain an understanding of how cougar harvest could be used as a deer management tool. A critical component of this includes understanding how the cougar population responds to various harvest levels so that CPW can balance deer management with cougar management.

¹Leadville to Cañon City (D-16) and Poncha Springs to Walsenburg (D-34)

Figure 1: Study areas D-16 and D-34

