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## **SURVIVAL AND MORTALITY OF MOUNTAIN LIONS IN THE BLACKFOOT WATERSHED, WEST-CENTRAL MONTANA**

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We investigated population effects of harvest on mountain lions (*Puma concolor*) using a pseudo-experimental before-after-control-impact (BACI) design. We achieved this through 3 yrs of intensive harvest followed by a recovery period. In December 2000, after 3 yrs of hunting, approximately two-thirds of district 292 was closed to lion hunting, which effectively created a refuge, representing approximately 12 percent (915 km<sup>2</sup>) of the total Blackfoot watershed (7908 km<sup>2</sup>). Hunting continued in the remainder of the drainage, but harvest levels declined between 2001 and 2006 as quotas were reduced. From January 1998 and December 2006, a total of 121 individual mountain lions were captured, 152 times, including 82 kittens, and 39 juveniles and adults. Of these, 117 individuals were collared and monitored on average for 502 days (~ 16 mos) with males remaining on the air for shorter periods ( $\bar{X}$  =284 days) than females ( $\bar{X}$  =658 days). Hunting was the main cause of mortality for all age and sex classes across the study period, accounting for 36 of 63 mortalities documented. This was followed by illegal mortalities, natural, unknown, depredation, and vehicle collisions. Across the study period, any lion in the Blackfoot watershed had, on average, a 22 percent annual probability of dying due to hunting. We found human harvest to be an additive mortality source, i.e., hunting mortality was not compensated for by increased survival of remaining individuals that shapes the overall survival structure of mountain lion populations. As such, wildlife managers through the use of human harvest, have the capability to regulate mountain lion population growth.