

## DYNAMICS AND VIABILITY OF A COUGAR POPULATION IN THE PACIFIC NORTHWEST

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**Abstract:** Cougar (*Puma concolor*) populations are believed to be at high density and increasing throughout western North America, especially in the Pacific Northwest, as evidenced by increasing cougars/humans encounters. Harvest rates have increased as a result. To test this hypothesis, we determined the density, fecundity, survival, and growth rate of a cougar population in northeastern Washington, northwestern Idaho, and southern British Columbia. From 1998 to 2003, 52 cougars were captured, radio-collared, and monitored. We recorded fecundity through den site investigation and snow tracking, and mortality by weekly telemetry. Survival rates were estimated for kittens (0-1 yr), yearlings (1-2 yr), and adult (2-12 yr) males and females. Average overall density was 1.09 cougars/100km<sup>2</sup> or 0.46 adults/100km<sup>2</sup>. We estimated litter size at 2.53 kittens, birth interval at 18 months, proportion of reproductively successful females at 0.75, and age of first reproduction at 30 months, for a maternity rate of 0.63 male or female kitten/year/adult female. Average survival rate for all radio-collared cougars was 0.59, 0.77 for adult females, 0.44 for adult males, 0.37 for yearlings, and 0.57 for kittens. Hunting accounted for 92% of the mortalities of radio-collared cougars. Age- and sex-specific survival and fecundity were entered into a stochastic two-sex matrix model. We used computer simulations to determine the population stochastic growth rate and to assess its viability over 25 years. The annual stochastic growth rate of this population was  $\lambda = 0.80$  (95%CI = 0.11). Starting with a total initial abundance of 357, the median times to fall below a demographic collapse ( $N = 30$  adults) and extirpation ( $N = 0$ ) were 8.5 and 25.9 years. Our findings suggest that, contrary to popular belief, cougars in the Pacific Northwest are currently at low to moderate densities and are declining. Alternative hypotheses may account for the increased conflicts between cougars and humans in this area.