## Factors Limiting Bighorn Sheep in the Yarrow-Castle Region of Southwestern Alberta

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Abstract: During the early 1980s, pneumonia was responsible for a drastic decline in bighorn sheep (Ovis canadensis) in Alberta's Yarrow-Castle area. Over 2 yr, the population decreased from ~400 sheep to fewer than 150. By 1995, the population recovered to ~200 individuals. Aerial surveys indicated that a general decline in bighorn ewes through the mid-1990s recently stabilized. Reasons for failure to reach the population size observed in the early 1980s currently is unknown; however, it may be linked to various factors, including spatial changes in range use, predation, reduced food quantity and/or quality, reduction in habitat quantity and/or quality, or poaching. Alternatively, the population may be at carrying capacity under current habitat conditions or inbreeding may reduce vigor of the population. We measured vital demographic rates that may help identify crucial limiting factors. Activities completed include capture and collaring of 46 ewes, monitoring reproductive success and survival, preliminary identification of seasonal ranges, and calculation of annual reproductive and survival rates. Prime-aged ewe survival during 2003 was low compared to bighorn ewe survival rates in Alberta, while the value for 2004 was on par with other Alberta populations. The population is experiencing growth but the reproductive rate may be rather sensitive. During the lambing period in 2003, 28 of 33 collared ewes bore lambs of which 11 survived to yearlings. In 2004, 14 of 25 lambs survived to 1 yr. Data gathered during our 3-yr study will be used to develop a predictive, age-structured population model. Information collected from GPS collars will be linked to resource selection patterns, and ultimately provide key areas for habitat enhancement initiatives. Our data will establish the foundation for future recommendations to help determine the most effective approach for management of this population.

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