Wintering Strategies by Mountain Goats in Interior Mountains: Preliminary Results

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Abstract: Winter is an important season for mountain goats (*Oreamnos americanus*), characterized by generally restricted movements and high juvenile mortality. Winter habitat selection and wintering strategies were examined in 2 adjacent areas of southeastern British Columbia: the southern Purcell Mountains (deeper, moist snow with few wind-swept slopes) and the southern Rocky Mountains (shallower, dry snow with more exposed wind-swept ridges). Fifteen GPS collars were placed on goats in each area from January 2004 to August 2005, covering 2 winters which differed in snow depth severity between near normal (winter 2003/2004) and 25 to 40% below normal (2004/2005). We examined mountain goat habitat selection using multivariate logistic regression at the scales of winter range within home range (broad scale), and at the stand level within winter range (fine scale), with a focus on the winter of normal snow depths. Male home ranges (83.5 km^2; 95% fixed kernel) were 2.5 times larger than those of females (32.6 km^2). Winter range size did not differ between areas (average 1.8 km^2 and 2.6 km^2 for males and females, respectively) and varied from 2.2 to 8.0% of home range. Topographic variables dominated model selection. At the broad scale, goats in both areas selected winter ranges closer to escape terrain in more rugged terrain, on warmer aspects (solar radiation modelling), and containing less mature dense forest than within the home range. At the fine scale, goats in both areas selected rugged habitat at upper mid-elevations and on warmer aspects. Alpine areas were avoided in the Purcells and selected in the Rockies. The ruggedness index was an extremely strong variable in the models. No selection for mature forests was observed in either area, and there was little availability or use of early seral stands. During the low snow winter of 2005, goats used 2.2 to 3.4 times larger ranges and hourly movement rates were 25 to 50% greater than in winter 2004. While females in the Purcells used lower elevation during winter 2005, no other differences in elevation use between winters were detected. Goats wintering in areas of higher snowfall made less use of open, high-elevation alpine habitats compared with animals wintering in areas of lower snowfall. However, our hypothesis that goats in areas of deeper snow make greater use of old and mature stands was not supported.

Key Words: British Columbia, habitat, mountain goat, multivariate logistic regression, *Oreamnos americanus,* Purcell Mountains, Rocky Mountains.

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