

Habitat Selection of Bighorn Sheep at Radium Hot Springs, British Columbia

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Abstract: Bighorn sheep (*Ovis canadensis*) habitat quality and availability near Radium Hot Springs, British Columbia have been affected by urban development, recreation, forest in-growth, and prescribed fire, among other factors. I analysed sheep location data in order to improve understanding of sheep habitat use and to identify important management considerations in relation to land use planning, human activity, and vegetation management. I compiled radio-collar Global Positioning System (GPS) data from a sample of 62 sheep, with each sheep collared for 8 to 12 months between 2002 and 2009. I used these data to generate separate resource selection functions (RSFs) for summer and winter. During summer, sheep selected habitats that were characterised by open forest structure, high elevation, and terrain complexity. During winter, sheep did not usually select habitats within or near escape terrain, but selected habitats that were characterised by open forest structure, low elevation, and low slope angle. Slopes selected by males in winter averaged $15.4^{\circ} (\pm 0.33^{\circ})$, while those selected by females averaged $9.2^{\circ} (\pm 0.21^{\circ})$. Males selected steeper terrain than females year-round (2.9° , $\pm 0.34^{\circ}$, $t = 8.70$, $P < 0.001$), and in all months except May and June when females were travelling to or occupying lambing range. Several sheep management issues arise out of the tendency of the Radium Hot Springs herd during winter to occupy flat, valley floor habitats within or in close proximity to human developments. These include high rates of sheep-vehicle collisions on highways, habituation resulting from use of urban habitats, and increased sedentary behaviour.

Key words: bighorn sheep, British Columbia, GPS, habitat selection, *Ovis canadensis*, radio-telemetry, Radium Hot Springs, resource selection

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