

DEMOGRAPHIC FRAGMENTATION OF A PROTECTED WOLVERINE POPULATION BISECTED BY A MAJOR TRANSPORTATION CORRIDOR

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Roads fragment terrestrial ecosystems around the globe, but the effects of this fragmentation on biodiversity remain poorly understood. Wolverines (*Gulo gulo*) are snow-dependent carnivores that occur at low densities and they exhibit low genetic diversity at the southern extent of their range where they are snow-limited, rare and fragmented by human development. Therefore, understanding the effect of roads on population connectivity is crucial to effective wolverine management in a changing climate. We examined whether the Trans-Canada Highway, Canada's largest east-west transportation corridor, affects wolverine movement and gene flow in the Canadian Rocky Mountains. We used noninvasive genetic sampling methods to collect DNA samples (i.e. hair, scat) from Banff, Kootenay, and Yoho National Parks and provincial lands in British Columbia and then used population and individual-based genetic analyses to quantify genetic structure of the wolverine population across the highway in the national parks complex. We collected 2586 DNA samples between 2010 and 2013 from which we identified 49 unique individuals (29 males, 20 females). We detected equal numbers of males and females that crossed the highway (4 males, 4 females); however, dispersal and gene flow were affected differently in the two sexes by the transportation corridor. We detected weak population structure in males and relatively strong genetic differentiation in females spanning the highway. Our results demonstrate that sex-biased dispersal across a major highway can lead to genetic isolation and demographic fragmentation in a protected carnivore population, highlighting the urgent need to maintain connectivity for wildlife species over an expanding road network.