

Population Dynamics of Mountain Goats in Southwestern British Columbia, Canada

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ABSTRACT: With over half of the world's population of mountain goats (*Oreamnos americanus*) occurring in British Columbia, the province has a global responsibility for the conservation of this species. Mountain goats in coastal ecosystems are particularly vulnerable during the winter months, when deep snow restricts their movements and distribution, and large old forests provide crucial snow interception cover and forage. During the summer of 2015, rare catastrophic and intense wildfires occurred in the southwestern British Columbia, a coastal ecosystem, covering approximately 19,000 ha in total area. As a result of these wildfires, several legally protected mountain goat winter ranges were burned to varying degrees. Preliminary analysis indicated that $\geq 75\%$ of the forest area burned 75% less likely to be occupied and contained $\geq 80\%$ fewer individuals, and it directly relates to the removal of forest cover. These fires may have caused a substantial shift in the goat population, whereby goats from adjacent winter ranges may have migrated to the Meager Complex. Summer inventories of Mount Meager indicated a 138% increase in the mountain goat population in 2009 and 2016. In 2018 and 2019 we radio collared 31 mountain goats in the Mount Meager Complex. We found mortality rates for goats of both sexes extremely high. Cumulative female and male survivorship were poor, and we estimated the population to be declining at approximately 17% per year (as estimated from survivorship and recruitment data), and approximately 10% based on the inventory data. We estimated that 40% of these mortalities were a result of avalanches. Mortality rates were initially high and have since stabilized in the Meager Complex with good kid recruitment. However, mountain goat populations in an adjacent burned area have experienced declines during the same period with low kid recruitment in surveys from 2016 to 2021. Consequences of climate change on coastal mountain goat populations will be discussed.

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