

Multi-scale Habitat Modeling: Delineating Mountain Goat Habitat in the Washington Cascades

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Abstract: Historical declines in mountain goat populations in Washington State have spurred the need for understanding goat-habitat relationships for effective habitat management. GPS data from 42 collared mountain goats across the native ranges of Washington State were used to explore relationships between the use and availability of habitat. Our analysis represents one of the most extensive landscape-level habitat relationship studies conducted on Mountain Goats. Multi-scale path analysis methodology allowed us to test various ecologically informed relationships between landscape structure and pattern and the temporal movements of mountain goats at the home range scale. Our analysis compares available paths with random paths of matched identical spatial topology. We use matched case logistic regression to determine the spatially and temporally explicit scales that are the strongest predictors of seasonal mountain goat habitat. The methodology of this analysis is transferable and applicable to other studies that aim to predict mountain ungulate habitat. Additionally, the original use of path-level methodology in a case-control framework contributes to knowledge of statistical analysis of resource selection studies.

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