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## **LANDSCAPE-SCALE CONSERVATION AND MANAGEMENT OF MONTANE WILDLIFE: CONTEMPORARY CLIMATE MAY BE CHANGING THE RULES**

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Both paleontological and contemporary results have suggested that montane ecosystems to be systems of relatively rapid faunal change compared to many valley-bottom counterparts. In addition to experiencing greater magnitudes of contemporary change in climatic parameters than species in other ecosystems, mountain-dwelling wildlife must also accommodate often-

greater intra-annual swings in temperature and wind speeds, poorly developed soils, and generally harsher conditions. Research on a mountain-dwelling mammal species across 15 yrs of contemporary data and historical records from 1898-1956 suggest that pace of local extinctions and rate of upslope retraction have been markedly more rapid and governed by markedly different dynamics in the last decade than during the 20th century. This may mean that understanding past dynamics of species losses may not always help predict patterns of future loss. Given the importance of clinal variability and ecotypic variation, phenotypic plasticity, behavioral plasticity, and variation in climatic conditions, for widely-distributed species' geographic ranges to be determined by different factors in different portions of their range is not uncommon. Consequently, greatest progress in understanding distributional-change phenomena will occur with coordinated, landscape-scale research and monitoring. Landscape Conservation Cooperatives and Climate Science Centers are newly emerging efforts that may contribute greatly to such broad-scale investigations, e.g., climate-wildlife relationships. Based on our empirical findings and our review of related literature, we propose tenets that may serve as foundational starting points for mechanism-based research at broad scales to inform management and conservation of diverse montane wildlife and the ecosystem components with which they interact.