

Simulating future climate and land-use impacts on
at-risk species in parks and protected areas.

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Alpine and sagebrush ecosystems in the mountain west are under threat from climate change and development. The wolverine, fisher, greater sage-grouse, and pygmy rabbit are iconic at-risk species in the region. We explore the impacts of future climate and land-use change on these species using a spatially explicit simulation model, HexSim. We run the model with simulated future land-use and vegetation incorporating downscaled output from five global climate models. This framework allows us to project changes within parks and protected areas as well as across the region. In alpine habitats, 86% and 77% of simulated wolverine and fisher populations located in protected areas are projected to decline by mid-century. Similarly, in sage-steppe habitats, 100% and 96% of sage-grouse and pygmy rabbit populations found in protected areas are projected to decline. Many protected areas may lose their most iconic species if they are unable to tolerate or adapt to future change.