Montana Gap Analysis: A First Approximation of Wilderness Contributions to Wildlife Conservation[TWS]

Melissa M. Hart
Wildlife Spatial Analysis Lab, Montana Cooperative Wildlife Research Unit, University of Montana, Missoula 59812

Although we count on wilderness areas as the backbone of our current nature reserve networks, these areas seldom have been completely inventoried, raising questions about their specific contributions to conservation of biodiversity. Data sets developed for the National Gap Analysis Program provide a means to assess the biodiversity values of wilderness areas using geographic information systems (GIS); here, we present an example for the state of Montana. Gap analysis hinges on three GIS inputs: land cover, predicted distributions for native terrestrial vertebrates, and land stewardship. A land cover map was developed by classifying Landsat Thematic Mapper imagery using 23,351 ground-truth plots. For 414 vertebrates, habitat-relationship models were built; distributions were mapped using known ranges, land cover, topography, and hydrography. A stewardship map was compiled from digital data provided by the Bureau of Land Management and other agencies and organizations. Once all base layers were compiled, they were overlayed to describe current patterns of biodiversity management. Not surprisingly, cover types and wildlife species typically found at higher elevations were better protected. Furthermore, more area was reserved in western than in eastern Montana. Of 414 vertebrates, 62.6 percent had <10 percent of their predicted distributions in reserved lands (status 1 and 2), versus 1.7 percent with >50 percent of their distributions protected. By taxonomic group, reptiles were least protected, followed by amphibians, birds, and mammals. These results apply to all lands assigned status 1 and 2 (5.1% and 2.53% of the state, respectively); results specific to wilderness (3.7% of the state) also will be presented.