Resource Selection, Predation Risk, and Underestimates of Refuge Habitat for an Alpine Obligate

Wesley M. Sarmento* Blackfeet Fish and Wildlife, Browning, MT

Joel Berger, Colorado State University, Fort Collins

Understanding relationships between animals and their habitat is a central goal in ecology with important implications for conservation. Misidentified habitat requirements, however, can have serious repercussions because land protections or reintroductions might occur in areas of less than optimal habitat. Studies of resource selection have greatly facilitated an understanding of relationships but suffer because rarely used, but vital habitat features may be insufficiently described. A critical element for many prey species is escape terrain or some form of refuge. Mountain goats (*Oreamnos americanus*) are a species well known for their use of cliffs to escape predation, but a survey of the literature reveals at least twelve different approximations of goat escape terrain. Here, we sought to 1) optimize mountain goat escape terrain estimates, and 2) highlight the assumption that the time an animal spends in an area is proportional to importance. We experimentally exposed mountain goats to grizzly bear (predation risk) and ungulate (control) imitations and recorded subsequent escape locations in Glacier National Park, Montana, USA. Through a used-unused resource selection function we tested 21 landscape variables for explaining goat escape terrain. We found that distance to slopes greater then 60o best explained where mountain goats fled. Additionally, we identified the need to incorporate behavior and predator interactions into resource selection studies. With 27 failed mountain goats reintroductions these results have consequences on habitat characterization and considerations for species restoration. Managers should consider the availability of escape habitat when protecting land or reintroducing prey species.