Human Visitation Limits the Utility of Protected Areas as Ecological Baselines

MARK J. BIEL, *National Park Service, Glacier National Park, West Glacier, MT, USA 59936*

WESLEY SARMENTO, *Montana Fish, Wildlife and Parks, Conrad, MT, USA 59425*

JOEL BERGER, *Wildlife Conservation Society, Bronx, NY 10460/Department of FWC Biology, Colorado State University, Fort Collins, CO, USA 80523*

ABSTRACT: A key goal of protected areas is the conservation of biodiversity. Increasing visitation, however, can compromise ecological integrity. A fundamental conundrum is that if parks are to serve as our most pristine places, then we must understand how human presence alters biological interactions. Species that redistribute themselves closer to people is of growing management concern both in and out of national parks because of 1) human safety, 2) animal health, and 3) ecological consequences. Drivers of distributional change are often dissimilar but may include increased association with people for predator avoidance – the human shield hypothesis. We examine redistribution patterns with comparative, observational, and experimental approaches contrasting ecological responses of an iconic species in an USA national park - Glacier. Specifically, we focused on the role of predator avoidance and resource enhancement to test whether a cold-adapted alpine obligate, mountain goats, (*Oreamnos americanus*), mediate their distribution by increasing spatial overlap with humans. Individuals that enhanced mineral acquisition through access to human urine concomitantly reduced behavioral and ecological responses to grizzly bear (*Ursus arctos horribilis*) experiments. Goats near people also displayed reduced group sizes, vigilance, use of escape terrain, and forfeited migrations to naturally occurring minerals. Our findings re-enforce the increasing complexities of natural area management because visitation is altering ecological interactions. While protected areas offer some forms of baselines for scientists and enjoyment for millions of visitors, redistribution of species and associated ecological changes signifies that additional care will be needed in what we perceive as pristine and what is anthropogenically-altered.

Biennial Symposium of the Northern Wild Sheep and Goat Council 21:34; 2018

KEYWORDS Mountain goat; *Oreamnos americanus*; habituation; fear; human-mediated predation refugia; predator-prey; migratory; human-wildlife conflict.