

Assessing the impacts of recreation on habitat use by mammals in an isolated alpine protected area

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Abstract

The management objectives of many protected areas must meet the dual mandates of protecting biodiversity while providing recreational opportunities. Balancing these mandates is made difficult by constraints on monitoring trends in the status of biodiversity and impacts of recreation. Using detections from 45 camera traps deployed between July 2019 and September 2021, we assessed the potential impacts of recreation on spatial and temporal habitat use for 8 medium- and large-bodied terrestrial mammals in an isolated alpine protected area: Cathedral Provincial Park, Canada. We hypothesized that some wildlife perceive a level of threat from people, such that they avoid ‘risky times’ or ‘risky places’ associated with human activity. Other species may benefit from associating with people, be it through access to anthropogenic resource subsidies or filtering of competitors/predators that are more human-averse (i.e., human shield hypothesis). Specifically, we predicted that large carnivores would show the greatest segregation from people while mesocarnivores and ungulates would associate spatially with people. We found spatial co-occurrence between ungulates and recreation, consistent with the human shield hypothesis, but did not see the predicted negative relationship between larger carnivores and humans, except for coyotes (*Canis latrans*). Temporally, all species other than cougars (*Puma concolor*) had activity patterns significantly different from that of recreationists, suggesting potential displacement in the temporal niche. Wolves (*Canis lupus*) and mountain goats (*Oreamnos americanus*) showed shifts in temporal activity away from people on recreation trails relative to off-trail areas, providing further evidence of potential displacement. Our results highlight the importance of monitoring spatial and temporal interactions between recreation activities and wildlife communities, in order to ensure the effectiveness of protected areas in an era of increasing human impacts.

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