

Ecologists find national park tourists offer elk and antelope shelter from predators

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(Phys.org) —Prey animals, such as elk and pronghorn, are changing their behavior in close proximity to predictable human activity. A new paper published in *PLOS ONE* by ecologists at Colorado State University provides a novel investigation of the predator shelter hypothesis by exploring how benign and predictable human activity - such as designated recreation areas, parking lots, and roads - affects the feeding and alert behavior of prey species.

The research results support the predator shelter hypothesis and suggest that [prey species](#) are able to take advantage of "refuges" created in areas of elevated, non-lethal [human activity](#) that are generally avoided by predators such as wolves and bears.

"Protected areas provide crucial habitat for conserving important animal populations as well as providing increasingly popular recreational opportunities for the public," said lead author Graeme Shannon, a behavioral ecologist in CSU's Department of Fish, Wildlife, and Conservation Biology. "It is essential that human impacts on wildlife behavior be better understood so that effective conservation management can be balanced with the visitor experience."

Shannon and his fellow CSU researchers analyzed detailed behavioral data collected from elk and pronghorn in Grand Teton National Park over four years. Both elk and pronghorn demonstrated lower perceived risk - increased feeding and reduced vigilance - along the Teton Park Road, where human activity was 30 times greater than the quieter River

Road nearby.

The research findings also show that elk and pronghorn congregate in smaller herds in areas with more park visitor activity, a behavior commonly associated with reduced perceived risk. These "refuges" are likely driven by predatory species such as wolves and bears being more sensitive to human activity than ungulate species (elk and pronghorn), which will tolerate human presence and activity for the benefits associated with reduced risk of predation.

While human activity is potentially beneficial for prey species, the behavior changes could cause effects on the ecosystem, including the reduction in available habitat for large carnivores such as bears and wolves. Furthermore, elevated numbers of grazing and browsing elk and antelope could increase feeding pressure on plant communities.

"These refuges may act as strong attractors for prey populations and thus could have the potential to drive impacts similar to those proposed by the reintroduction or removal of large carnivores," said Shannon.

The study, "Behavioral Responses Associated with a Human-Mediated Predator Shelter," is authored by a collaborative team from CSU's Warner College of Natural Resources and the Department of Biology. The paper highlights how the complex relationships of predator-prey interactions can be altered by human activity. The researchers show that human activity has differential effects across species and underscores that not all human activity is the same.

In Grand Teton National Park, the animals are exposed to tourists using defined park roads and trails in a predictable manner, which does not present a lethal threat, and therefore may be much easier for a species to tolerate. This is very different to the responses that would be observed in areas where hunting takes place and animals respond to humans as

predators.

The study illustrates the importance of animal behavior research and highlights the need for a more in-depth understanding of the complexity of ecological systems and predator-prey relationships.

More information: Shannon G, Cordes LS, Hardy AR, Angeloni LM, Crooks KR (2014) "Behavioral Responses Associated with a Human-Mediated Predator Shelter." *PLoS ONE* 9(4): e94630. [DOI: 10.1371/journal.pone.0094630](https://doi.org/10.1371/journal.pone.0094630)

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