

# Outdoor enthusiasts scaring off native carnivores in parks

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(PhysOrg.com) -- Even a quiet stroll in the park can dramatically change natural ecosystems, according to a new study by conservation biologists from the University of California, Berkeley. These findings could have important implications for land management policies.

The study compared parks in the San Francisco Bay Area that allow only quiet recreation such as hiking or dog walking with nearby nature reserves that allow no public access. Evidence of some native carnivore populations - coyote and bobcat - was more than five times lower in parks that allow public access than in neighboring reserves where humans don't tread, the researchers report.

The dearth of these animals in the parks carries implications beyond just these species. Since the carnivores in the study are often the top predators in their areas, these animals also shape the rest of their surrounding ecosystems. The flight of large animals from heavily visited parks for more serene surroundings could, in turn, influence populations of small animals and plants, the researchers said.

"Carnivores are sensitive indicators of human disturbance," said Sarah Reed, postdoctoral scholar in UC Berkeley's Department of Environmental Science, Policy and Management and the study's lead author. "Their presence or absence can be a good, early clue to how the ecosystem is doing."

To measure carnivore numbers, Reed studied the droppings of six native

and non-native mammalian carnivores in 28 parks and preserves in northern California. The parks in her study allow public access, but don't allow motorized vehicles or hunting and fishing. Most visitors to these parks hike or walk their dogs, Reed said. The preserves in the study have limited or no public access.

Reed found more than five times as much coyote and bobcat scat in preserves with no public access than she did in the parks. Coyotes and bobcats are both native carnivores. She also found more scat from the native gray fox and the non-native red fox in unvisited areas, and more dog and cat droppings in visited parks.

Reed said she did not expect these findings. She and many other conservation biologists assumed that activities such as hiking or horseback riding were relatively benign, she said. "I was surprised that the difference was so dramatic," Reed said.

Adina Merenlender, cooperative extension specialist in the Department of Environmental Science, Policy and Management and senior author on the study, said the findings "are probably the most surprising results that have come out of my lab to date."

The differences in carnivore populations are even more surprising when you consider that these animals are most active at night, dawn and dusk, and that people visit parks during the day, Reed said. "We assumed that carnivores and people were avoiding each other in time and space," she said.

Reed was initially conducting a different study on carnivores when she realized that the differences in their numbers between sites with and without public access were so large that they obscured the data she was looking for. "The evidence I was seeing was strong enough that it warranted a study of its own," Reed said.

For her study, which will be published in the September 2008 issue of the journal *Conservation Letters* but is now available online, Reed chose 14 parks in Marin, Sonoma and Napa counties and paired them with 14 nearby preserves with no public access. Each paired park and preserve had to have similar characteristics, such as size and amount of nearby development. The 14 parks include Jack London and Annadel state parks and Shiloh Ranch and Spring Lake regional parks in Sonoma County.

Historically, people have tended to view recreation and conservation efforts as tightly linked, especially when it comes to land management. Parks aim to both protect natural resources and allow visitors to enjoy them. But if this enjoyment is actually detrimental to conservation, as Reed's findings suggest, park agencies may have to change how they think about preservation, the researchers said. Reed feels that, in some cases, it may be necessary to create separate sites for conservation and recreation. That could mean separate areas within large parks or designating small parks, such as the ones Reed surveyed, as either for conservation or recreation,

"People used to think, 'Well, just keep everyone on the trail.' Before this study, that would have been a reasonable assumption," Merenlender said. "But now that we're showing this larger scale effect, we're going to have to shift our working paradigm on how we address land management."

To look at carnivore populations, Reed walked one to two miles in each park or preserve, picking up and bagging every carnivore dropping she saw. Because it's difficult to identify droppings visually, she used genetic analyses to determine each scat's owner.

Reed was surprised to find that coyotes and bobcats were avoiding parks with public access entirely, not just their trails. The parks she visited are small enough that the animals can't find a peaceful spot, Reed said.

Reed thinks the carnivores are leaving the parks for calmer neighboring areas. Her study didn't address the reason for their flight, but she thinks it likely that the mere presence of humans disturbs the animals. The noise of humans traipsing and chatting through parks, our smell or just the sight of us could frighten animals away from their homes, Reed said.

Between urban sprawl, agriculture and outdoor enthusiasts, coyotes, bobcats and foxes may be hard pressed to find undisturbed areas. Outdoor recreation is on the rise around the world, especially in natural areas surrounding large urban centers, such as in the San Francisco Bay Area. For example, the number of Americans day hikers jumped nearly 800 percent between 1960 and 2000, according to national surveys.

These extra hikers, bird-watchers and mountain bikers put pressure on park agencies to open government land and private preserves for public access. "This level of recreational activities in parks is just one of the many ways that the growing human population is squeezing the habitat for these more sensitive species," Reed said.

Reed said her findings affected her on a personal level, because she enjoys hiking and other outdoor activities. "For many of us, as conservation biologists, as environmentalists, this is a pretty uncomfortable result," she Reed.

Provided by UC Berkeley

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