

Puma tracking reveals impact of habitat fragmentation

April 18 2013



A female mountain lion named 7F is chased into a tree so researchers can replace her tracking collar.

(Phys.org) —In the first published results of more than three years of tracking mountain lions in the Santa Cruz Mountains, UC Santa Cruz researchers document how human development affects the predators' habits.

In findings published April 17 in the online journal *PLOS ONE*, UCSC associate professor of environmental studies Chris Wilmers and colleagues with the UC Santa Cruz Puma Project describe tracking 20 lions over 6,600 square miles for three years. Researchers are trying to

understand how [habitat fragmentation](#) influences the physiology, behavior, ecology, and conservation of pumas in the Santa Cruz Mountains.

"Depending on their behavior, animals respond very differently to human development," Wilmers said. Lions are "totally willing to brave rural neighborhoods, but when it comes to [reproductive behavior](#) and denning they need more seclusion."

Wide berth

The large predators living relatively close to a metropolitan area require a buffer from human development at least four times larger for reproductive behaviors than for other activities such as moving and feeding.

"In addition, pumas give a wider berth to types of human development that provide a more consistent source of human interface," such as neighborhoods, than they do in places where human presence is more intermittent, as with major roads or highways, the authors write.

Wilmers and his team, which includes graduate students, and a dog tracking team working with the California Department of Fish and Wildlife, have captured 37 lions to date. Twenty-12 females and eight males-were closely followed between 2008 and 2011. Once captured and anesthetized, the lions' sex was determined, they were weighed, measured, fit with an ear tag and a collar with a [GPS transmitter](#). The collars, developed, in part, by an interdisciplinary team at UCSC, including [wildlife biologists](#) and engineers, transmit location data every four hours.

Researchers are able to track the lions' movements and calculate locations of feeding sites, communication spots, and dens. Pumas

communicate with scent markings known as "scrapes" where they scrape leaves or duff into a pile then urinate on it. Males typically make the scrapes, advertising their presence and availability. Females visit scrapes when looking for mates.

The Puma Project team set up and monitored remote cameras at 44 scrape locations and documented males and females, which confirmed GPS data from the pumas' collars.

Researchers also found 10 den sites belonging to 10 different female lions. They visited 224 "GPS clusters" where activities suggested a feeding site, and located prey remains at 115 sites.

Wilmers said the research is helping identify corridors where pumas typically travel between areas of high-quality habitat. This includes neighborhoods where females often are willing to explore for food for their fast-growing brood.

Brushes with humans

Brushes with humans have resulted in casualties when lions were struck by cars or caught raiding livestock. One male known as 16M was shown to have crossed busy Highway 17 between Scotts Valley and Los Gatos 31 times. He was hit and badly injured in November 2010 and recently shot and killed after attacking sheep. A female, 18F, who may have been 16M's mate, was killed in 2011 crossing the winding highway.

Eight of the 11 pumas that died during the study were killed when caught attacking domestic livestock. Wilmers advised owners of goats or other livestock to consider keeping them in a "fully-enclosed mountain [lion](#)-proof structure."

While Wilmers advised people to proceed with caution in any known

mountain lion roaming grounds he said humans need not panic about the presence of [mountain lions](#).

The study's conservation goals are meant to help lions survive in the midst of rapidly growing [human development](#) by building awareness of lions' behavior and providing safe transit opportunities under or over major highways.

Provided by University of California - Santa Cruz

Citation: Puma tracking reveals impact of habitat fragmentation (2013, April 18) retrieved 29 April 2024 from <https://phys.org/news/2013-04-puma-tracking-reveals-impact-habitat.html>

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