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PARKS/WILDLIFE: Cougar decline results in critical changes to Yosemite ecosystem -- study (Thursday, May 8, 2008)

Patrick Reis, *Land Letter* reporter

Ninety years ago, black oak saplings covered the meadows of the Yosemite Valley, waiting in the shade of their full-grown brethren. Today, there are fewer saplings and the downward trend could result in a landscape entirely devoid of the saplings by the end of the century, leaving the senior oaks to fall unreplaced.

The unlikely culprit for the change: cougars, or a lack thereof.

According to a paper from Oregon State University professors, a decline in the cougar population in the early 1990s led to an explosion of deer, who gobbled up oak saplings and radically changed the valley's landscape.

"In the absence of large carnivores or control by humans, ungulates can profoundly alter ecosystems," concludes the study, to be published in the May issue of the journal *Biological Conservation*.

William Ripple and co-author Robert Beschta measured the diameters and looked at the rings of more than 3,000 trees to model the progression of young oaks into mature specimens, a process called recruitment. They found that since the 1920s, when cougars were subject to extermination efforts by park workers, fewer saplings have matured. These missing recruitment groups are the result of deer and other ungulates being allowed to graze an area without threat from predators, the researchers say.

The oak stands remain prevalent in Yosemite now only because the older generation remains standing, but, Ripple says "if there continue to be few cougars in Yosemite Valley, and there continues to be high density of deer, the recruitment gap will widen even more."

Park officials take notice

The lack of black oaks is not lost on park officials, according to Scott Gediman, a spokesman for Yosemite. The park has an active restoration program for oaks with measures including fencing off developing stands to protect them from deer, he said.

Many small mammals and birds depend on oaks' acorns for nutrition and branches for shelter.

Comparing the present landscape with photos from the 1920s, Gedimen sees oaks replaced by Ponderosa pines, whose needles are less appealing to deer.

However, Gediman cautions premature conclusions. He said he is not certain the changes amongst oak saplings can be blamed on a lack of cougars, or even if there is a lack of cougars at all.

The elusive cats can be tough to count, he noted. "[Cougars] have ranges from 100 to 200 miles. We see them in the valley, we see evidence that they're in and around the park," he said. "We don't really know if that population has decreased. We have no reintroduction plans for cougars -- we feel the population of them is right where it should be."

Gediman also points out that other factors could be responsible for the changes in the ecology, including the increased frequency of forest fires, which tend to harm more oaks over conifers. Climate change could also contribute to the changing ecosystem, Gediman said.

Ripple and Beschta argue against a link between fires or climate change and the changing flora in their paper.

"The study makes some good points -- we don't want to say they did it wrong, but there are some areas where further study would be helpful, especially in documenting the cougar's decline," Gediman added.

A call for restoration

"Trophic cascade," the widespread changes in an ecosystem that come when its top predator is removed, is a well-documented phenomenon, Ripple said, referring to studies of the effects of the disappearance and reintroduction of wolves and grizzly bears in Yellowstone National Park.

Advocates for the predator reintroduction -- from cougars in Yosemite to gray wolves in Yellowstone -- cite the Yosemite study as evidence of reintroduction's benefits.

"Reintroduction does work, it works quite well," said Peter Galvin, conservation director for the Center for Biological Diversity. "Yellowstone, the world's most closely studied ecosystem, is the best example of putting an ecosystem back together. With wolves coming back in, large elk herds were no longer able to placidly stay in one place."

He acknowledged that predators sometimes come into conflict with livestock. But he emphasized that the few cases in the United States have been greatly overblown, pointing to examples in Italy and Eastern Europe of functional, self-sustaining carnivore populations.

The "ecology of fear" keeps ungulates moving and prevents them from thinning an entire area, Galvin said.

To be reintroduced, predators need sufficient habitat, which cougars have in Yosemite, according to Galvin. He said the key is to find areas where the big cats could roam the park unperturbed by visitors.

But Galvin is confident that reintroduction can happen. "What led to predators' population decline were government programs and individual perceptions and attitudes have changed," Galvin said. "The public more fully understands the value of predators to land and to ecosystems."

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