ECOLOGY

Yosemite: Protected but Not Preserved

The spectacular landscape of California's Yosemite Valley looks natural and has been protected for more than a century. Yet ecologists know that today's valley is not the one that enchanted naturalist John Muir when he promoted the formation of Yosemite National Park. One of the park's emblematic species, the California black oak (*Quercus kelloggii*), is in decline, a problem usually attributed to a lack of fire and an invasion of conifers. Now, two researchers have traced the trees' suffering through a complex chain of effects that starts with human influence and extends from cougars through mule deer to oaks and primroses. The result of that "trophic cascade" is that there are very few young oak trees to replace their elders, hurting other species from shrubs to birds and invertebrates and apparently reducing overall biodiversity, according to a report in the May issue of *Biological Conservation*.

"It's not just Yosemite," says ecologist Thomas Rooney of Wright State University in Dayton, Ohio, who was not involved in the study. He notes that other oak species are in decline across the United States. "It shows that habitat protection alone is not enough. You need the predators."

In Yosemite, the paper says, the direct cause of oak mortality is the high density of mule deer, which have been munching the oaks' basal sprouts and seedlings for nearly a century. Intriguingly, the mule deer's abundance stems not from a lack of predators—as with elk in Yellowstone National Park (*Science*, 27 July 2007, p. 438)—but from shy ones: elusive cougars (*Puma concolor*). The mountain lions keep the deer in check elsewhere in the park but avoid areas like the valley, where people congregate.

"There are higher deer densities now than in the 1850s," when American settlers first entered Yosemite Valley, says ecologist William Ripple of Oregon State University, Corvallis, who co-authored the study with OSU colleague Robert Beschta, a forest hydrologist.

After Yosemite became a national park in 1890, visitors swarmed into the valley, eager to see its parklike landscape of black oaks and famed wildflower-filled meadows. Officials began eliminating cougars, bobcats, and coyotes and protecting mule deer from hunting. By 1925, deer were numerous, and park observers noted a marked decline in the most popular wildflower, the evening primrose (*Oenothera hookeri*). Although not apparent at the time, that's also when the black oak seedlings began to disappear, say Ripple and Beschta, who in 2006 measured the diameters of more than 3000 black oaks. They also took tree ring cores from 40 sites close to the valley's visitor center and sites 4 to 8 kilometers away. Black oaks can live as long as 500 years, but a "healthy stand includes a mix of young and old trees," says Beschta. Oaks close to the visitor center have almost no young trees or basal sprouts. The deer are using people as "protective shields," says Ripple. Deer had also nipped off the flower buds of nearly every evening primrose the scientists saw.

Free lunch. Mule deer near Yosemite's visitor center feast on oak seedlings and evening primrose flowers (*inset*).

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Today, Yosemite managers burn prescribed areas to keep out conifers and clear the way for oaks. But fires can't do what most needs to be done, says Ripple: "Get the baby oaks to grow." That's not likely to happen until there are fewer deer. "It wouldn't be popular to have culling in a national park," Rooney says, "but it may be necessary" if the valley's biodiversity is to be preserved. **–VIRGINIA MORELL**

Cancer Genome Goes Global

There's an ambitious new sequencing project on the block: the International Cancer Genome Consortium (www.icgc.org). Leaders aim to raise $1 billion to sequence 50 human cancers over the next 10 years and share the data. This week, it joined a crowded field; similar efforts are under way at the U.K. Sanger Institute and the U.S. National Institutes of Health (*Science*, 8 September 2006, p. 1370). But a global organization makes sense because the prevalence and environmental causes of cancer differ around the world, says consortium leader Thomas Hudson of the Ontario Institute for Cancer Research in Toronto: "We're trying to prepare ourselves for the next wave." Organizations in nine countries, including in China, Singapore, and India, have signed on. **–JOCELYN KAISER**

Stresses Grow in U.K. Science

U.K. parliamentarians attacked the Labour government this week for slighting science and mismanaging the current allocation of £2.8 billion. The science committee in the House of Commons also leveled harsh words at the agency that supports astronomy, particle physics, and government labs, saying it had axed fields and facilities without consulting the community and citing "particular weakness" in its peer-review systems and management. Neglect has "caused immense damage to fundamental science in this country," says particle physicist Brian Cox of the University of Manchester. However, U.K. innovation secretary John Denham argued in a speech that "as a government, we have fought for, and won, record resources" for science.

–DANIEL CLERY

Wage Understanding, Not War

The social and behavioral sciences may get as much as 20% of a proposed $250 million boost to the U.S. Department of Defense's basic research budget to counter terrorist threats without force. "We have given our troops many technologies to win conflicts, but we haven't done enough to help them avoid conflict," William Rees, the Pentagon's chief of basic research, told *Science* last week. Rees was amplifying a message from other officials, including Defense Secretary Robert Gates, who credits a small team of anthropologists embedded with military units in Afghanistan for helping to reduce violence in the region.

–YUDHIJIT BHATTACHARJEE

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