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Robotic raptors reveal complexities of avian alarm

Biology professor lectures on animal communication

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SANTA CRUZ » The work of a University of Montana biology professor has inspired a New York Times profile, a music video by a rapping science teacher and the creation of a beer called "Pygmy Owl Itty Bitty IPA."

Professor Erick Greene spoke about the "sophisticated and subtle" ways wild animals communicate with one another at the Ecology and Evolutionary Biology Department seminar series this week at UC Santa Cruz.

Birds call out to warn other members of their species when they detect a particular predator, Greene said, and other animals eavesdrop on those conversations. For example, if a chickadee chirps about a nearby goshawk — a species that eats a lot of jays but not many chickadees — can jays interpret what the chickadees are saying?

"So far, it seems like yes, this is the case," Greene said during the talk. "We've had jays just go nuts."

To test how birds respond to predators, Greene and his colleagues have developed an unusual tool: taxidermied robotic raptors.

"These are incredibly lifelike," Greene said, as he displayed pictures of a screech owl, a Cooper's hawk and a pygmy owl, each one equipped with computer-controlled internal mechanisms that allow the scientists to move them in subtle ways. "This guy waggles its tail, and they look around."

And the "robo-raptors" seem to work. In a video taken at a bird feeder in Missoula, a tranquil scene erupted into a cacophony of staccato chirps when a robotic pygmy owl was revealed.

Birds aren't the only creatures using avian signaling, Greene said. Walnut hawk moth caterpillars produce whistling sounds when threatened, some of which are at the same frequency as the high-pitched "seet" calls that chickadees and other birds use to sound the alarm that a predator is near.

Greene said he suspects the caterpillars' whistles may be distracting enough to help them avoid becoming a bird's next meal.

"Just about every time we played that caterpillar sound, the birds bail for the bushes or freeze," Greene said.

UCSC's Ecology and Evolutionary Biology Department invited Greene to campus because there's broad interest in his work, said Bruce Lyon, a pro-

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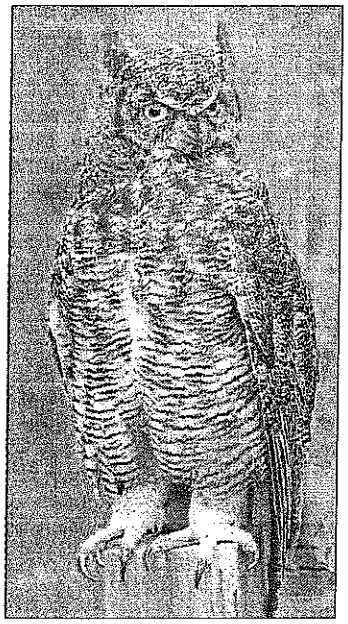

CONTRIBUTED BY ERICK GREENE

University of Montana biology professor Erick Greene uses stuffed robotic raptors, such as this great horned owl, to see how other birds respond to predators.

Raptors

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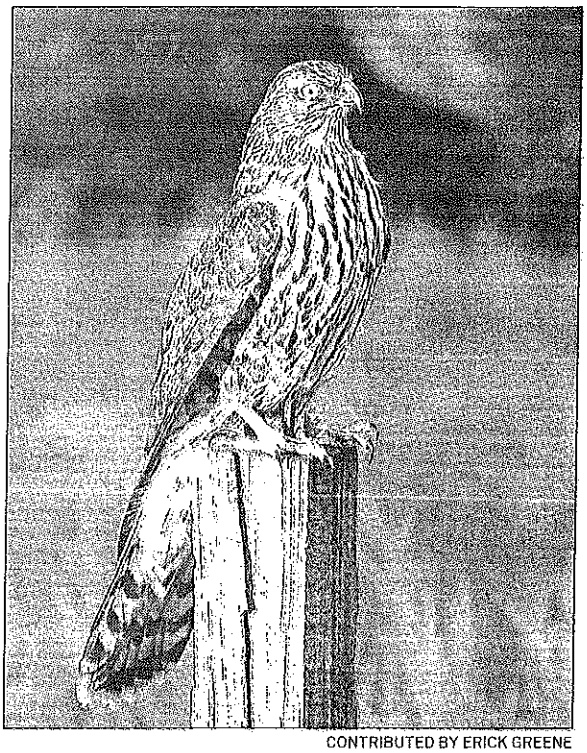
fessor in the department.

"Science is about technology, but it's also about understanding our world," Lyon said. He discusses Greene's work in the classes he teaches because of the depth and quality of Greene's experiments, Lyon said.

"The guy's a brilliant naturalist," Lyon said. "He makes these brilliant connections."

Greene said he still feels a sense of wonder when he thinks about the natural relationships and complexities waiting to be discovered in the wild. But we can hear creatures communicating with one another even without venturing beyond our backyards, he said.

"There's very cool stuff we don't know about 40 feet outside this door," Greene said.



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Scientists can program the "robo-raptors" to make small, life-like movements, such as swiveling their heads. Seen here is a northern goshawk.