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# The Little Owls That Live Underground

## Burrowing owls can thrive amid agricultural development and urbanization—so why are they imperiled?

By John Moir

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It's almost midnight and a lone white pickup truck sits atop a grassy hill on a remote tract of government land near Dublin, California, that is used as a military training base. In the driver's seat, biologist Jack Barclay hunkers down over a night-vision scope that amplifies light 30,000 times. Barclay is watching two quarter-size pieces of glowing reflective tape that mark a trap he has concealed in low weeds 100 yards away. He has brought a truckload of equipment to this site to band some of its few remaining burrowing owls.

Barclay sees a flicker of movement. *Now*. He presses a remote-control button, and a spring-loaded net arcs over the owl. Barclay sprints to the net and slips the owl headfirst into a plastic-coated can that once held frozen grape juice. The bird inside the can is still; only its legs protrude. Slits in the can's side allow Barclay to examine the owl, and he records that this is a female. Under her breast feathers he sees a burgundy-colored "brood patch" of bare skin with abundant blood vessels that enables her to transmit heat efficiently to her eggs and young. Barclay attaches identifying bands to the owl's legs and within minutes releases her.

Barclay began his career working with the Cornell Laboratory of Ornithology on an innovative program to reintroduce the peregrine falcon to the Eastern United States, from which the bird had disappeared. The reintroduction effort, which released captive-bred peregrines into the wild, was so successful that the program concluded its work in the mid-1980s.

Barclay eventually moved to California and joined an environmental consulting group. In 1989, he began monitoring birds at the San Jose International Airport, where a burrowing owl colony had set up housekeeping near the tarmac. The owls fascinated him and became his passion; he has devoted the past 20 years to working on burrowing owl conservation.

"I've always been interested in birds of prey," he said. "Burrowing owls represent an interesting conservation challenge. It's a high-profile bird that generates a lot of interest."

Burrowing owls are playful, nine-inch-tall birds with bold, lemon-colored eyes. They are the only North American bird of prey that nests exclusively underground. Although they are called "burrowing" owls, the birds prefer to let other animals do the digging; they then show up as uninvited guests and appropriate the burrow. Because burrowing owls are active during the day, they are a highly visible species.

The owls often decorate their burrow entrances with dung, animal parts, bottle caps, aluminum foil and other trash. Scientists suspect the behavior may benefit the birds by attracting insects or signaling to other owls that the nest is occupied. During breeding season, a pale, sun-bleached male

stands guard at a burrow entrance and brings food to the female, who attends to six or eight chicks in their underground sanctuary.

Strange as it seems, close-cropped fields near airport runways, like where Barclay first studied the birds, offer good burrowing owl habitat. The low-cut grass dotted with ground squirrel tunnels mimics the owl's native rangelands that were kept short by grazing animals or prairie dogs.

In many places where burrowing owls could thrive, however, ground squirrels have been eradicated. Where this has happened, biologists sometimes install artificial burrows for the birds, often with volunteer assistance from an informal network of amateur burrowing owl enthusiasts. Barclay has published plans for an artificial burrow that is used in many locations. It is constructed from four-inch-wide flexible plastic piping that runs underground to a nest made from an irrigation valve box that's roughly the size of a toaster oven. The bottomless molded-plastic valve box allows for a natural earthen floor, while the removable top provides easy access for biologists to monitor the birds.

In recent decades, as agricultural development and urbanization have spread across Western North America, the once-numerous burrowing owl has declined in vast areas of the Great Plains and Canada.

The burrowing owl is now listed as endangered in Canada, threatened in Mexico, and a national bird of conservation concern in the United States. In addition, nine states and four Canadian provinces identify the owl as endangered, threatened or a species of special concern. A subspecies that lives only in Florida is also accorded some protections.

California, which supports one of the largest burrowing owl populations in the United States, designated the burrowing owl a species of special concern in 1978. But since then, the bird has nearly disappeared from coastal regions along the length of the state as well as from the entire San Francisco Bay area.

Conservationists have argued for years that the bird needs additional regulatory protection. Ironically, burrowing owls adapt well to living with humans. The owl's supporters believe that with proper conservation measures, burrowing owls and people can readily live side by side.

Biologist David DeSante, founder of a research and conservation organization called the Institute for Bird Populations, has found the burrowing owl population to be highly fragmented, generally declining and vanishing in some places. But DeSante also found a dramatic increase in the bird's numbers along the earthen irrigation canals in Southern California's Imperial Valley. This area, which represents only 2 percent of the burrowing owl's range in California, now supports 70 percent of the state's birds.

"Burrowing owls are an 'abundant imperiled species,'" Barclay says. The large number of birds clustered in the Imperial Valley masks the significant losses elsewhere. And with so many birds in this unnatural setting, it leaves them vulnerable if the earthen irrigation canals are ever changed or the area's ground squirrels are eradicated.

Part of the problem is that the owl's preferred habitat—very short grass with burrowing mammals—is exactly the kind of land that is often slated for development. When developers plow & mow weeds to reduce the fire hazard in areas they plan to eventually build on, they can inadvertently attract burrowing owls—and later provoke battles with conservationists.

Three years ago, Scott Artis, a cell biologist, became infatuated with a dozen adult burrowing owls that he discovered near his new home in Antioch, California. But since last fall, Artis has watched the partially developed grassland two blocks from his home undergo a startling transformation as a developer prepared to build more houses.

First, chain-link fences posted with "No Trespassing" signs were erected around parts of the 25-acre parcel. Next, five-inch-square doors were installed in burrow openings in the ground. The "eviction" doors allowed animals to come out of the burrows, but not go back in. A few days later, the eviction doors were removed and sulfur smoke bombs were tossed inside to eradicate the ground squirrels. Finally, the burrow entrances were filled with earth. Although the birds tried, they were unable to return to their homes. No one can say where the owls are now or what might have happened to them.

“They are such a cute little bird, and they were there all the time,” Artis said. “Seeing owls in the daytime is not what you’d expect. Sometimes a family of six or eight would fly across the street and land at their burrow. It was incredible.”

Under the complicated and sometimes confusing regulations that govern the owl, unless a nest is active, a developer can relocate or evict the birds. Artis mounted a campaign to bring attention to the owls’ plight, which generated extensive media coverage in central California, and is continuing to lobby for stronger regulations for the bird.

“The situation in Antioch is the classic case of what so frequently happens with burrowing owls when an area is developed,” Barclay says. “Other species usually vacate earlier, but the burrowing owl often stays until the bulldozers arrive.”

Author and biologist Thomas Roberts, who has studied burrowing owls, notes that with effective management the bird can thrive in urban settings, especially in abandoned landfills, at airports and at the margins of golf courses and athletic fields. The great irony, Roberts said, is that the bird’s ability to coexist with people puts it squarely in the path of suburban expansion.

“Burrowing owl management is not inherently difficult,” Barclay says. “The owl has rather modest requirements that can be met in a variety of settings, usually without vast acreages.”

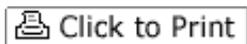
The burrowing owl’s predicament strikes a chord with people like Scott Artis not because the bird’s situation is so rare but because it is so common. A report released in March by Secretary of the Interior Ken Salazar showed that a third of the nation’s 800 bird species are endangered, threatened or in significant decline. Like the burrowing owl, many of these species are at risk because of habitat loss.

Protecting the bird’s habitat is the type of effort that Barclay thinks is needed. “Without a commitment of political will, we will likely continue to monitor the owl’s decline and disappearance,” he said. “This is a bird we should be able to accommodate, even in the face of development. The challenge is not whether it can be done, but rather to figure out how to do it.”

*John Moir is an award-winning science journalist and author of [Return of the Condor: The Race to Save Our Largest Bird from Extinction](#).*

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