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Solar Refuge

How one Arizona solar farm
has become a haven for
displaced burrowing owls

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Photos courtesy Wild at Heart

Home, Sweet Solar Home

Displaced by development, can Arizona's burrowing owls find refuge on renewable energy farms?

BY REBECCA L. RHOADES

If you spend any amount of time online, you're guaranteed to come across videos of pint-size speckled birds with spindly legs and expressive wide-eyed looks chasing each other around like mini loaves of bread on stilts, comically bobbing and weaving their heads and staring inquisitively into the camera.

These curious social media sensations are Western burrowing owls, and they were once common across the open desert and agricultural lands of Arizona.

Standing about 8 inches tall and weighing only about 7 ounces, burrowing owls (*Athene cunicularia*) are one of the smallest owls in North America and the only owl species to live underground. As their name implies, they make their homes in burrows. They're widely considered an ecological and cultural symbol of the Southwest. And they're also protected as a U.S. Fish and Wildlife Service Bird of Conservation Concern and a state species of concern.

Modern development and the ongoing loss of open desert habitat has threatened the burrowing owl's existence. Greg Clark first noticed that something was amiss while volunteering for the Arizona Breeding Bird Atlas project in the mid-1990s. "We were not finding burrowing owls in historical locations where they were well documented," he recalls.

Burrowing owls have evolved to take over abandoned burrows of small animals, such as prairie dogs and ground squirrels. They were especially widespread in regions of the Kaibab National Forest near Seligman, which is also home to endangered black-footed ferrets, Gunnison's prairie dogs, and ferruginous hawks.

"Burrowing owls are a sentinel species for other birds and mammals," Clark explains. "If you lose any one of the three core species, the other ones suffer. If you lose the black-footed ferret, you lose control of the prairie dogs, which would basically eat everything,

and their population would collapse. Then the owls would not get the burrows that would be dug, and they'd have no place to live." Development, drought, and past extermination campaigns have drastically reduced the number of prairie dogs and ferrets, which in turn has reduced the number of burrows.

As such, burrowing owl populations dwindled dramatically in the areas outside Seligman, as well as in parts of Prescott Valley, on the Navajo Nation, and in the grasslands surrounding Douglas. "Once they can't find burrows, whether natural or artificial, they can get picked off by other predators, especially great horned owls," Clark notes. "If you don't have a burrow, you're at risk. That's just the bottom line for burrowing owls."

SAVING BURROWING OWLS

Since 2001, Clark has served as the burrowing owl habitat coordinator for Cave Creek-based raptor rescue Wild at Heart. The nonprofit organization is a world leader in the relocation of burrowing owls.

"The vast majority of owls are at risk because they're in the wrong place," Clark explains. The main culprits are the development of housing communities, industrial complexes, and even highways, as well as the loss of croplands.

Clark continues, "People always ask me, 'Why should we care about these birds?' Well, they're a marker for successful land use. If you're trying to recover land that has suffered from overgrazing, invasive species,



Concrete blocks are placed around the opening of an artificial burrow, creating a bigger opening that allows several baby owls to run into the entrance at the same time if threatened.

drought — if a burrowing owl is living there, you're doing a pretty good job. Plus, they're one of the most charismatic of all the raptors. You can admire the prowess of raptors for catching prey or just appreciate how they look. But there are very few owls that will actually make you laugh out loud. Burrowing owls have the attributes of tiny little people."

While Arizona does not require wildlife surveys for all new construction, one may be needed if the project is near open grasslands or desert areas. When owls are found on the land, the developers contact Wild at Heart to trap and remove the birds. The rescue then partners with private and government

Wild at Heart and Longroad Energy volunteers build an artificial burrow at the Sun Streams solar complex.



landowners to relocate them to new habitats. That's where Longroad Energy comes in.

UNEXPECTED SANCTUARY

Solar farms have not always had the best reputation when it comes to wildlife, especially birds. Early farms used heliostat panels comprising giant mirrors that would concentrate sunlight onto a central receiver tower and create intense heat. These superheated beams of light could singe birds' feathers, igniting the birds in midair.

"They didn't cause mass-casualty events by any means, but those were not environments in which birds could survive if they flew through them," says Deron Lawrence, vice president of Environmental at Longroad Energy.

"But no one in the U.S. is building concentrating solar at this point."

Today, clean energy companies use photovoltaic panels, which absorb sunlight instead of reflecting it. These panels are not only more affordable but also safer for the environment. In fact, photovoltaic panels "are excellent perches for birds," Lawrence says.

Longroad operates the massive Sun Streams Complex near the Palo Verde Generating Station on the outskirts of Tonopah, about 60 miles west of Phoenix. The approximately 10,000-acre complex, of which

about 6,000 acres are developed, is divided into four solar facilities.

The open expanses of land are characterized as creosote flats — arid, flat, rocky terrain covered mostly with creosote bushes.

"Our solar farms are natural ground and vegetation or desert underneath the panels," Lawrence explains. "Once the site is built, the ground is largely not disturbed for the life of the project, which is many decades. So the solar farms create really neat habitats for wildlife."

He continues, "People have been studying the sites, and they're finding that solar farms are actually protecting some of the smaller mammals. And birds, especially ground-nesting birds, will find places to nest at solar farms."

Recent studies by the Argonne National Laboratory and the Department of Energy's National Renewable Energy Laboratory support Lawrence's statements. The research facilities have been analyzing two solar sites in Minnesota and finding that native plants thrive under and around the panels, increasing habitats for animals such as bats and crucial pollinators, including bees, butterflies, and beetles.

All of this creates the perfect environment for burrowing owls.

FINDING HOME

Longroad set aside 250 acres of land for owl habitat, and in March 2025, Clark and the Wild at Heart team relocated nine owl pairs and one single male from a housing project 50 miles away to the solar site.

The owls were placed into a network of artificial burrows, each made from half of a 50-gallon plastic drum that simulates the size of a typical prairie dog burrow, 4-inch flexible irrigation tubes, 6-inch rigid PVC tubes, chicken wire, and concrete blocks.

"The owls can't make their own burrows. The soil is just way too tough," Clark says. "It turns out that they prefer our burrows to any of the natural ones that are available. In fact, they'll always leave a natural burrow and move into one of mine."

For the first 30 days, the burrows are tented. This ensures that the owls get acclimated to their new dwellings without flying off and allows the rescue team to provide food — frozen mice — to the birds and monitor their health. Once the tents are removed, volunteers continue to provide food for another seven days while the owls get used to their new hunting grounds.

"Then that's it," Clark says. "Burrowing owls are pretty adaptable. They'll put up with just about anything. They really only care about things that can catch and eat them. Once they understand the risk for a spot, as

long as they have a burrow and a steady food supply, they're going to dig in and make the place their home."

Burrowing owls eat insects, such as spiders, pinacate beetles, and crickets. They're also a main predator of scorpions, and they're also known to catch frogs, toads, small snakes, bats, and rodents.

Because the solar panels attract insects, there's a steady supply of food for the owls. "The owls hunt and eat around the base of the panels," Clark points out. "Sometimes there are so many insects that they look like popcorn in a skillet, bouncing all over the place."

The panels also shield the small owls from larger birds of prey, while fencing around the solar farms stops animals such as coyotes and foxes from attacking the burrows.

Within one month of the first relocation, all of the females had laid eggs. Thirty six chicks hatched, and

29 survived. "We had 29 chicks that were fledged that year. We basically created 29 new baby owls out of the 18 or nine pairs that we started with," Lawrence notes. "What's really interesting is that the owls stayed all winter long without any supplemental feeding. Then this past spring, the owls started breeding and laying eggs again, so now we've got another cohort of new owls that are being raised."

While time will tell if this experiment is ultimately successful and can be replicated at other solar sites across the state and country, Clark and everyone at Wild at Heart and Longroad

remain positive. "I'm really happy about the results so far," Clark says. "The population of juveniles that are born there outstrips the adults that were the founding population. And that's exactly how it's supposed to work."

For more information or to volunteer, visit www.wildatheartaptors.org and www.longroadenergy.com. 🌱



According to Wild at Heart's research, owls prefer burrows that have 4-inch diameter openings.