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Science

Living with the Desert

Can we learn to love this landscape without killing it? Here's how one Arizona community found a way By TERRY MCCARTHY/TUCSON

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A bobcat regularly saunters up the arroyo leading to Paul and Carolyn Zeiger's desert property in Pima County, Ariz., and leaps onto the flat roof of their adobe-style house. As long as their pet terrier, Stella, is inside, they don't worry much. "The bobcat jumps around up there and takes care of the mice," says Carolyn, 61, a clinical psychologist from Boulder, Colo. The Zeigers also get the occasional rattlesnake on their porch, and in the summer they have to stay indoors to avoid the midday heat. But despite those inconveniences--and in part because of them--they have developed a deep love of the desert in the five years since they moved here. Twenty miles from Tucson, their house looks out on a plain of saguaro cacti stretching to the Rincon Mountains. At night the stars shine brightly without competition from human lighting. Paul, 68, a semiretired software developer, gets all the hiking and bike riding he wants, and Carolyn attends lectures to learn how to grow desert plants in their yard. "You have to learn to adjust in the desert," says Carolyn.

It's an adjustment a lot of folks have been making of late. Since 1950, the population of Arizona, New Mexico and Nevada has increased from 1.6 million to 10 million as Americans discover the desert's clean air, warm weather, open spaces and relatively affordable housing. But without zoning codes to restrict it, much of that growth has been distressingly haphazard. By the time the Zeigers began looking for a retirement home in the 1990s, what they found was a lot of strip malls, golf clubs and sprawling subdivisions decorated here and there with cactus plants. They were horrified. "We didn't want to move to a place where they are just screwing up the desert again," says Carolyn.

One exception, they discovered, was Pima County, which covers 9,186 sq. mi. of southern Arizona, including the city of Tucson. Pima has developed a conservation plan that permits growth while protecting the desert environment--a plan that has become a template for communities across the Southwest. "The old debate about whether growth is good or bad is irrelevant," says Chuck Huckelberry, Pima County administrator. "We have been growing for 50 years [in Tucson]. But we control where our growth occurs so it maximizes benefits and minimizes impacts."

There's a lot of growth to control. From 1990 to 2003, Arizona's population increased 53%, making it the second fastest growing state in the nation, after Nevada (another desert state, whose population grew 87% in the same period). Developers working in the U.S.'s four major deserts--California's Mojave, Arizona's Sonoran, Texas and New Mexico's Chihuahuan and Nevada and Utah's

Great Basin--can't build houses fast enough. In the town of La Quinta, Calif., southeast of Palm Springs, property prices jumped 48% last year, and new-home buyers have to go on waiting lists or hope to win a developer's lottery for the right to buy a small patch of desert.

What those developers are only starting to realize is that deserts are not what they appear to be. Arid, sparsely vegetated and seemingly inhospitable, they look like nature's waste lots, ripe for occupation and improvement. Even the word desert implies "unoccupied." But despite the shortage of water and wide temperature fluctuations, deserts are the host of a wide variety of species, each of which has adapted in its way to life in a desert ecosystem. Couch's spadefoot toads can live underground for much of their lives, awaiting some moisture before they come up and breed. Saguaro cacti are able to suck up a ton of water from one rain shower and then do without more rain for a year. Sidewinder rattlesnakes move across dunes in a unique S-shaped motion that minimizes contact with the scorching sand.

But living on the extremes of viability makes desert creatures surprisingly sensitive to disturbance. Golf courses and suburban lawns soak up sparse groundwater, and indigenous species suffer from the earthmovers, off-road vehicles and domestic pets that new arrivals bring. In California's Coachella Valley in the Mojave Desert, each of the 110 golf courses uses some 750,000 gallons of water a day. "Deserts have fragile ecosystems, and they are being threatened by this development," says William Presch, director of the desert-studies program at California State University at Fullerton. "If we don't understand how the desert environment works, we will lose it."

Once a desert landscape has been despoiled, it recovers slowly, if at all. "Where you have rain, things grow back in 20 or 30 years. In the desert Southwest, it takes centuries," says Huckelberry, an engineer by training. Pima County, he is quick to point out, is not antigrowth--far from it. Every year for the past decade, the population has grown by 15,000 souls and covered 4,500 acres of desert in new housing. The newspapers are flush with property advertisements, the roads out of town dotted with signs for new developments with names like Coyote Creek and Saguaro Buttes. The median single-family-home price in 2004 was \$176,500, up 14% from the year before. County planners estimate that the

population, now at 943,795, will top 1.6 million by 2050.

But in 1997 the county suddenly found itself paralyzed by a bird, the cactus ferruginous pygmy owl, which was listed as an endangered species after a survey found just 12 of them left in the state. The owl, which weighs 2.5 oz. and nests in cavities in saguaro cacti, had established a small population in prime development land northwest of Tucson. After the bird's listing, house building in the area came to a halt.

Huckelberry decided to use the owl's plight as the impetus to craft a comprehensive conservation plan. He assembled an unlikely coalition of

developers, Realtors, ranchers and environmentalists and drew up a blueprint that would protect not just the pygmy owl but a total of 55 threatened species--while leaving room for housing development in nonsensitive desert regions. "We believed it was better to be at one table rather than have a huge fight," says Bill Arnold, one of the county's biggest Realtors. "Everyone was a winner in the end."

The Pima County board of supervisors ratified the plan, dubbed the Sonoran Desert Conservation Plan, and last year the county proposed a \$174 million bond issue to buy up open land for conservation. The measure passed easily, with 65% voter approval. Under the plan, the county allows concentrated growth in designated areas while preserving swaths of open space in environmentally sensitive core areas in a large ring around Tucson. That open space preserves the characteristic desert vistas while providing corridors for wildlife to move around the edges of housing areas. Huckelberry aims to preserve 263,880 acres in that way.

In addition to the plan, the county has adopted rules governing the exterior colors of new houses, the amount of light that can be given off at night and the amount of water that can be used for gardening. In the 260-unit Arizona Senior Academy, where the Zeigers chose to settle, grass lawns and water-thirsty plants like oleander are forbidden, there are no streetlights on the roads, and half the land is preserved as open space for wildlife habitat. The houses are built in clusters of four sharing a single driveway and auto court and are designed to be inconspicuous: all exterior walls must mimic the brown and ochre tones of desert soil.

The Sonoran Desert Conservation Plan was written to conserve the region's biodiversity, but Huckelberry concedes that even the most careful planning cannot forestall all the threats that man poses to the desert. Domestic dogs and cats, for example, can wreak havoc on native species of birds and small mammals. One of the main reasons for the pygmy owl's decline was predation by house cats.

An even more serious threat is posed by buffel grass, an invasive species that was originally imported from Kenya to feed cattle. Adapted to being trampled by elephants and capable of spreading widely with little water, buffel grass has migrated west from the rangelands of Texas, bringing a new threat, fire. To conserve water, most desert species in the Southwest grow far apart, making it hard for fires to spread. Buffel grass grows easily in dry soil, forming a carpet of dry, flammable stalks that burns very hot after a lightning strike and can engulf cacti, yucca, ocotillo and the paloverde trees. "None of the native plants have fire adaptation. If they burn, they die," says Tom Van Devender, a senior research scientist at the Arizona-Sonora Desert Museum in Tucson. "If there is recurring fire, you get a conversion from desert to savannah grassland."

But the most fundamental limitation to life in the desert is water, and no matter how sensitively houses are located aboveground, everyone is still drawing from

the same precious supply of groundwater. In the long term, overuse of groundwater means slow death for desert plants, whose roots are unable to reach down far enough to sustain them. When plants die, animals run out of food and shelter--a process that is often noticed only after it's too late.

The idea of treating the desert gently, pioneered by forward-thinking planners like Huckelberry, is finally starting to catch on. "The conservation issue has just exploded," says Mike Chedester, education curator for the Living Desert University in Palm Desert, Calif. The program began only three years ago, and now he runs 124 courses a year on desert ecology and xericulture, or gardening with desert plants. "We have many students who come out to the desert, buy a home prelandscaped with lawns that need watering two or three times a day, and after a while they realize it doesn't make sense."

Carolyn Zeiger is doing her best to reduce the impact their home makes on the desert. "Given the rate the desert is being gobbled up by people like us, my feeling is we need to put some back," she says, standing on her porch and pointing to the plants in her yard. "I put in native plants only--ocotillo, Arizona rosewood, desert willow, prickly pear. I start them with a little water, but soon they will survive on their own."