

# Climate change is ravaging Anza-Borrego Desert State Park, warn scientists. What can be done?

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Under a crescent moon, a Baja California treefrog wades among rushes and water hyacinth in San Felipe Creek—a wetland along the western

edge of Anza-Borrego Desert State Park that researchers fear could be rapidly shrinking as the climate changes.

Upstream, environmental scientist Samantha Birdsong is on the hunt for such native amphibians, whose abundance indicates the health of the ecosystem.

"There's one, right in the [aquatic plants](#)," Birdsong says excitedly, the tiny creature's eyes shining in the glow of her headlamp. She quickly records its location on her phone, a chorus of treefrogs serenading the five-person State Parks team as they start the hourslong survey.

Today, researchers have changed their tune. Streams are disappearing, plants shriveling. Animals are desperate for nourishment with iconic bighorn sheep evermore dependent on human interventions.

Park officials headquartered in Borrego Springs are now scrambling to get baseline data for places such as San Felipe Creek, which in recent years, has dried up along several miles of Highway 78.

These southwestern ciénagas are not only home to native amphibians, they also serve as watering holes for deer, skunks, bobcats, bighorn sheep and mountain lions, explained Danny McCamish, senior environmental scientist for California State Parks' Colorado Desert District.

"It's very concerning to look at a picture from 2005 where you'd be standing in a marsh up to your knees in mud, and now it's just dry grass," said the 39-year-old in his soft Kentucky accent.

He and his team are also closely monitoring Anza-Borrego Desert State Park's most iconic plants, such as creosote, mesquite, cholla cactus, fan palms and ocotillo. Last year, researchers at the University of California,

Irvine used satellite images to document a nearly 40% decline in vegetation cover throughout the [desert region](#) since the 1980s.

"Noticeably, starting in 2010, our eastern section has undergone a massive drying," McCamish said. "Sometimes, all we have to do is add water to make things grow out here, but water is the limiting factor."

That's particularly concerning because massive losses in vegetation can trigger a general unraveling of the entire ecosystem, he said. "It's all trophic effects. When things disappear out of a food chain, so do the things above and below it."

## **A tipping point**

Researchers increasingly see desert plants and animals as delicately balanced on the edge of survival, rather than indestructible denizens of a brutal environment. The region's mercurial rainfall patterns, for example, can leave shrubs browning and brittle or usher in majestic wildflower super blooms.

Because desert ecology fluctuates so dramatically, it can be hard to discern long-term trends. Complicating things, the region's subtle and frequent seismic activity can send artesian wells bubbling to the surface or abruptly cut off groundwater to palm oases that have thrived for hundreds of years.

Still, many Borrego Springs residents are convinced the landscape they've come to cherish will soon be lost to human-caused warming.

"It's dry. There aren't near as many floods," said Rebecca Scott, referring to the deluges that have historically blasted out of mountain canyons to recharge the desert's water table.

On a recent weekday afternoon, the 69-year-old was shuttling backpackers between Julian and a water cache on the Pacific Crest Trail where the San Felipe Creek had run dry.

"It's climate change whether anyone wants to believe it or not," said Scott, who has lived full-time in Borrego Springs since 2006. "It makes me feel sad. We need to do something about it."

Between 1984 and 2017, native vegetation declined 37.5% across a study area that stretched from the U.S.-Mexico border to Palm Springs, according to a UC Irvine study published last summer in the *Journal of Geophysical Research: Biogeosciences*. The impacts were most pronounced between July and September when 87% of the surveyed landscape showed a downward trend.

Researchers concluded that drought patterns alone, starting around the turn of the century, couldn't fully explain the die-off. Rather, they postulated that entire vegetative communities have undergone restructuring in response to "new temperature extremes." Specifically, researchers found that summer heat increased by 0.5 degree Celsius per decade in the mountains and lower-elevation desert.

"You think of it as a super-hot and dry place, but it's also vulnerable to climate change," said James Randerson, co-author of the paper and professor of Earth science at UC Irvine. "Say we had a high amount of rain in a decade or two; maybe we'd see recovery. That's just not what we've seen in the last 34 years."

Those findings align with the work of Jim Cornett, a consulting ecologist who has been studying ocotillo in the park since 2007. He said that at his two study sites the bright green tentacled plants are steadily declining, showing little to no signs of regeneration.

"What I found in the last 15 years was not a single recruit was recorded," Cornett said. "That is not a single new young plant."

The iconic desert shrub faces multiple stressors, he explained, including desperate animals increasingly gnawing on it for water and sustenance.

"The ocotillos have to deal with caterpillars eating their leaves and antelope squirrels eating their stems," he said. "These are things that didn't happen in the past or were very rare. Now, they're commonplace."

Researchers say that many plants and animals will likely seek refuge at higher elevations if trends continue. However, hillside space is limited, and huge swaths of desert landscape are at stake.

## **Watering the desert**

The Anza-Borrego Desert State Park has tools to counteract or at least slow this habitat loss, from ripping out invasive tamarisk and restoring wetlands to patrolling for illegal off-roaders trampling wildlife.

But humanity's footprint isn't easily contained. Park visitorship soared during the pandemic, as San Diegans flocked to outdoor recreation, relishing the desert's intense quiet and moonlit vistas of red-tipped ocotillo and golden cholla cactus.

Former Superintendent Mark Jorgensen has spearheaded many efforts to protect the desert during his 36-year career with State Parks. Today, he's more concerned than ever.

On a recent morning, the spry 70-year-old sat on a large boulder surrounded by shin-deep water in Coyote Canyon, just north of Borrego Springs. A parade of Jeeps and trucks splashed through what's known as "Second Crossing," a spot Jorgensen remembers camping at as a young

Boy Scout.

About a decade ago, he said he was shocked to see the water at the crossing had temporarily disappeared during a hot summer day. The trend only got worse.

"In March of last year, it was completely dry," said the former ecologist. "That's totally unprecedented, at least in my lifetime. The creek is retreating upstream."

Jorgensen blames a host of activities, from the global burning of fossil fuels to over-drafting of the groundwater table by farmers and golf courses. Borrego Springs is currently required under a court settlement with the state to reduce its groundwater pumping by roughly 70% over the next two decades.

Not everyone in town is as concerned as Jorgensen. Down the road, affable parks employee Adam Asche hoisted boulders and regraded the canyon trail with an excavator.

"Quite honestly, it changes rapidly from time to time," said the 54-year-old, who's lived in Borrego Springs most his life. "It's all Mother Nature. Two years ago, this crossing was completely choked in with willows. We had a really big (flooding) event, and it washed them all out."

Still, Jorgensen—who author Edward Abbey once dubbed "California's Hayduke" in a book inscription—is determined to protect the park he calls home. He doesn't hesitate to email the current staff or complain that the rangers aren't being tough enough on off-roaders.

"I don't want to come off as a disgruntled old retired park superintendent, but I'm becoming that," he chuckled.

Last summer, he had a falling out with McCamish, the park's top environmental scientist, over a proposal to helicopter in water for federally endangered Peninsular [bighorn sheep](#). Jorgensen was pushing the idea hard.

The park, under Jorgensen's watch, built a system of "guzzlers," which collect rainwater to feed deer and sheep across the Santa Rosa, Vallecitos and San Ysidro mountains.

The program, established in the '70s, has helped the regional sheep population rebound from less than 300 adults in the mid-'90s to nearly 900 sheep in 2016, according to the most recent park records.

"I feel we should hold on very hard," Jorgensen said. "We should do everything we can to make sure this thing doesn't cascade any further."

However, the guzzlers can't function if it doesn't rain. In September 2020, four sheep were found dead near a 5,000-gallon container system that had run dry, Jorgensen said.

Last year, sheep advocates sought to avoid a repeat catastrophe, working with the U.S. Marines to fly in water to an empty guzzler on Whale Peak. The Society for the Conservation of Bighorn Sheep and several other groups helped organize and raise money for the operation.

McCamish initially opposed the idea: "I have a question of whether we're bolstering a manmade false population."

Public pressure for annual water drops could mount if drought continues, costing the park and its partners up to \$500,000 per mission, McCamish said. That's money the park district could be using for a long list of maintenance projects, from interpretive and trail signage to upper-elevation forestry projects.

"Bighorn sheep are important, but to what end are we watering a desert?" he asked. "Species are fighting for their range, but the range is telling us, it can't support them any longer."

Jorgensen bristled at the idea of allowing the desert ecosystem to fade away without a fight: "Some younger, modern-day ecologists are figuring: 'Well, it's climate change. These animals are going to have to adapt or die.' I'm not willing to accept that."

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