Dead Zone


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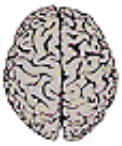

SEARCH

FROM THE CENTER of Tucson, the front range of the Santa Catalinas appears to be an impenetrable wall, a convoluted blade of rock slicing a mile into the sky. It's the backyard wilderness that we like to believe can coexist with a sprawling city.

Approach closer, and the wall flattens out--a little. You can see its deep canyons, the switchbacks of a few trails. But still it's unforgivingly rocky, hot and thorny. For all its appeal, we visit this land only fleetingly, shielded by plastic water bottles, Vibram soles, PowerBars, cellular phones.

There are animals better adapted than we to this land of steep slopes, tough vegetation, glaring sun and little water: desert bighorn sheep, *Ovis canadensis mexicana*. Only now you better make that "were." After roughly 8,000 years, it appears, the Catalina bighorns are on their way out.

The Arizona Game and Fish Department has conducted annual helicopter surveys of prime bighorn habitat, along Pusch Ridge on the mountains' southwest flank, since 1962. As recently as the late 1980s these surveys were turning up anywhere from two dozen to more than 40 sheep. Because of the rough terrain, and because bighorn sheep can easily hide from view under a boulder or juniper tree, biologists figured they missed some. They estimated the herd's size at between 50 and 100.

In the last few years, though, the numbers shrank. Nine sheep were seen in the spring of 1993, but only one that October. A single ram in 1994. Three in October 1995. In October of last year, for the first time, the fall survey turned up no sheep at all.

It's possible a few bighorns hid from the helicopter. It's possible they moved east or north of the survey area. It's possible some of these wary and fairly long-lived animals will linger on for a few years. But the trend is unmistakable. After thousands of years of successful adaptation to the tough conditions of a desert mountain range, Tucson's resident bighorns have practically vanished in a matter of decades.

Extinctions and extirpations--the biological term for the loss of a species in one part of its range--are occurring all over the globe. What's particularly troubling, and ironic, about this one is that the severest and final phase of the herd's decline coincided closely with a major effort to protect it. Land was set aside, studies were commissioned, educational programs conducted, public policies established, and none of these activities were enough to change what was happening up on Pusch Ridge.

"They were overwhelmed by so many different factors," says Jim Heffelfinger, regional game specialist for the Game and Fish Department. "Any single one might not have been such a big deal. And everybody blames somebody else. The recreationists point the finger at developers. Developers point at

recreationists. If mountain lions had fingers to point, they'd probably say someone else was to blame too."

So who is to blame--hunters, wildlife managers, hikers, developers? In this case, the best place to start looking may be in the mirror, because while biologists may argue the details in dissertations and journal articles for decades to come, one thing seems clear: The Catalina bighorns fell victim mainly to the hard grip of our love for the wilderness they represent.

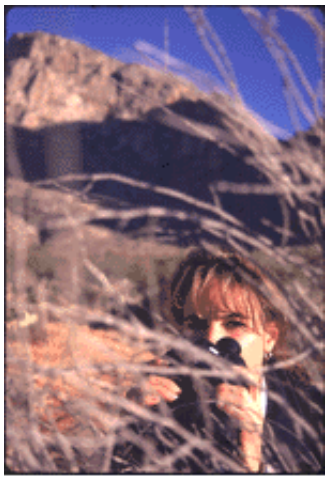
Juan Bautista de Anza saw some in the winter of 1774, on his way to Alta California via the southwestern deserts of what is now Arizona. "These animals...live among the cliffs that are highest and most difficult to scale," he wrote in his journal. "They are native to dry and sterile regions. Their flesh is better than that of deer. They multiply very slowly and almost never run in the level country."

Most of the particulars of his description have not been improved upon. Desert bighorn sheep are found mainly in rugged country. The rockier and steeper it is, the better they seem to like it.

"They're not like deer, which will come into backyards," says Kate Kelly, a University of Arizona graduate student who has studied the impact of recreation on the Pusch Ridge herd. "Bighorn sheep are wilderness animals."

They live even in the driest, sparest ranges of southwest Arizona and northwest Mexico. They feed on whatever the desert offers: brittlebush, jojoba, scattered grasses. Adults can certainly go a week without drinking water, maybe much longer. The bighorns that survive and thrive in the dry heart of Sonora's Pinacate Desert seem to be able to do entirely without drinking.

They are stocky, muscular, the color of dried clay. With their massive curled horns and a weight of 200 pounds or so, mature rams are particularly impressive. "It's wonderful to see an animal that large in such an impoverished habitat," says Paul Krausman, a University of Arizona wildlife biologist who has studied them for about two decades.



"These animals are never going to make it here," says UA graduate student Kate Kelly, who has studied the impact on recreation on the Pusch Ridge bighorn herd.

They escape predators mainly by avoiding them. Bighorns have excellent vision and hearing. On an exposed slope it's hard for a cougar or other predator to sneak up on a sheep. When bighorns do spot danger they generally escape by running higher with astonishing agility.

Though they are wary, the predictability of this habit has made them fairly easy prey for human beings with arrows or rifles. Archaeological evidence in Ventana Cave on the Tohono O'odham Reservation shows that native Americans began hunting them about 8,000 years ago.

In the 19th century bighorns became targets for explorers or settlers who were after game meat or a trophy set of ram's horns--or just a Wild West sporting challenge. As early as 1893 the Arizona Territorial Legislature, concerned about a decline in numbers, banned bighorn hunting.

But poaching wasn't taken too seriously, and there was no money for serious enforcement until the 1930s. In the meantime they were eradicated from most haunts that were either relatively accessible or near major towns: the San Francisco River basin in eastern Arizona, the Winchester Mountains, the Chiricahuas, the Santa Ritas. Some died out as domestic livestock introduced new diseases and out-competed them for food.

In 1939 the federal government established the extensive Kofa and Cabeza Prieta game ranges, in southwest Arizona, to safeguard the relatively healthy populations of sheep there. By then bighorns remained only in scattered sites in southeast Arizona, with bands lingering in the Superstitions, the Catalinas and a few other ranges, including the Tucson Mountains. By 1960 they had all vanished, except the herd on Pusch Ridge.

As de Anza suggested, desert bighorns typically live in small groups on scattered mountain ranges, separated from other herds by expanses of inhospitable lowland desert. The rare individuals--mostly rams--that move from range to range now and again seem to be enough to prevent inbreeding in the isolated groups.

Under natural conditions some bands die out due to severe drought, disease, or increased predation. But eventually wanderers from another range will recolonize suitable areas.

By the 1950s, though, the lowlands in the Tucson area--and throughout much of southeast and central Arizona--were becoming increasingly inhospitable to bighorns. Roads, fields, and housing developments made it more and more difficult for sheep to move between ranges. Pressured by hunting, habitat loss, and other human activity, the smaller herds were stranded on islands in a sea of development. They died out.

"Human activity cut off the movement corridors," says Krausman. "It's just taken a little longer for the effects to be seen on the bigger herd in the Catalinas."

The Catalinas, in fact, are lush by bighorn standards. In the 1920s, Coronado National Forest rangers estimated the range supported about 220 sheep. They roamed east of Molino Basin, where Mt. Lemmon Highway traffic curves by today. They also wandered well outward from the mountains. As recently as the 1970s sheep were seen occasionally where the Tucson Mall now stands.

In 1986 Richard Etchberger began working on a master's degree in wildlife biology at the UA. He was studying characteristics of desert bighorn habitat. His advisor, Paul Krausman, took him to the foothills on the north side of Pusch Ridge. A band of sheep appeared in the distance. "Take a good look at them," said Krausman, "because they're not going to be here when you graduate."

Krausman was off a little. The sheep lingered in the Catalinas just a little longer than Etchberger, now a professor at Utah State University. Today he uses the Catalina bighorns in his classes, as a graphic example of how not to manage wildlife.

His thesis examined two of the main factors that afflicted bighorns. "It was as if the bighorns were in a lobster claw," he says. "Fire suppression was destroying their habitat higher in the mountains, and habitat encroachment was creeping up from below."

UA wildlife biologist Paul Krausman says bighorn sheep "don't do well near human activity."

Etchberger began by measuring vegetation on the north side of the ridge--where bighorns were still found--and along the south-facing front range. He found the places sheep still roamed were more open and grassy than the areas they no longer used. The brushy places had been abandoned--or the sheep there had all been preyed upon by mountain lions, which can easily hide among scrubby vegetation.

The ridge's remoter north side was grassy because the Forest Service tended not to put out lightning-caused fires there. On the south side, facing Tucson, fires were put out quickly, and vegetation grew thick. "Any place too rough to fight a fire, or where people couldn't see a fire burning, had better sheep habitat," Etchberger says. He recommended the Forest Service conduct prescribed burns as a means of restoring abandoned bighorn habitat.

Much of that habitat had been set aside as the 56,430-acre Pusch Ridge Wilderness Area in 1978. The wilderness area was established in part to protect the sheep herd. But Forest Service regulations prohibiting roads and motorized equipment made it almost impossible--and extremely expensive--to conduct prescribed burns in a rugged wilderness area.

"We can't manage the wilderness solely for wildlife," says Coronado National Forest biologist Deborah Bieber. "We can't go out and burn it just for the sake of the sheep."

What the agency could do, though, was extinguish most of the naturally occurring fires in the wilderness area. This was a matter of public relations: After decades of fire suppression and brush accumulation, even small fires had the potential to grow out of hand and threaten plush homes at the forest boundary or in the village of Summerhaven high on Mt. Lemmon.

Forest Service officials did manage to pull off a few small controlled burns in the 1980s. Another one is planned for 1998. And a new plan that calls for management, rather than eradication, of natural fires is in the planning stages. Given federal budget constraints, though, large-scale prescribed burns are pretty unlikely.

While the growth of brush wiped out good bighorn habitat above, houses nibbled at it from below. Throughout the 1980s bighorns were slowly excluded

from most of their former foothill habitat along the front range and along the northwest base of Pusch Ridge.

Much of the money for Etchberger's study came from one of the largest development projects on the national forest edge, the Estes Corporation-built La Reserve, which claims a stylized ram's head as its logo. Estes offered to pay the UA $100,000 for bighorn sheep studies--though Krausman says only $60,000 was eventually paid. The La Reserve Homeowners' Association also still contributes ongoing funds to wildlife research at the UA.

In response to concerns about the sheep, Estes also agreed to build fewer homes near the wilderness boundary. In the long run, though, the density of homes may not make much difference. Etchberger says the problem with development isn't just a matter of houses replacing jojoba bushes, but of increased disturbance. "You put a house in the foothills," he says, "and you make the area accessible to people and to their dogs."

At the heart of the problem is this: Bighorn sheep are skittish animals. They're creatures of wilderness. "They don't do well near human activity," says Krausman.

Studies have shown that bighorns harassed by people feed less and are warier than sheep in undisturbed areas. They are disturbed by dogs, even small ones. Too much disturbance can cause stress and disease. They are particularly sensitive during the season when new lambs are born, which in southern Arizona is in late winter and early spring--peak hiking season.

Kelly recalls seeing a bighorn below Pusch Ridge a year and a half ago. "This was in a canyon where I hadn't seen anyone for three months all summer," she says. "I heard a crash, and around a corner walks this ewe. She was so incredibly cautious. She'd take a few steps and freeze and look around. She'd grab a mouthful of grass and then look up again. I kept looking at her eyes. She was that cautious, in a canyon where there hadn't been people all summer. I thought, 'These animals are never going to make it here.'"

Until 1993, the Pusch Ridge bighorns had good reason to avoid people, since they could be legally hunted. Desert bighorn rams are among the most cherished trophy hunting targets in North America--so coveted that a few years ago some desperate sport sneaked into the Arizona-Sonora Desert Museum and slaughtered the ram penned there.

Each year Arizona Game and Fish sells about 100 permits to hunt them, mainly in the western and southwestern mountain ranges where their populations are healthy. Another two permits are donated to the Arizona Desert Bighorn Sheep Society, a hunting group that raffles one permit and auctions the other. A few years ago the auctioned permit went for $303,000. The money raised goes into bighorn conservation and reintroduction programs; it has paid for some of the Catalina survey work.

Up to four bighorn permits a year were issued for the Catalinas in past decades; through 1992, only one permit was issued per year. Heffelfinger says that allowing a hunter to shoot a single trophy ram in no way hurt the population. "Removing an old ram has no impact on the number of ewes that are pregnant, which is what builds the population," he says.

"We can't manage the wilderness solely for wildlife," says Coronado National Forest biologist Deborah Bieber.

Krausman disagrees. "You shouldn't harvest a population of less than 125 individuals, especially when you don't know its age and sex structure," he says.

By the time of the last bighorn hunt, in the fall of 1992, the annual survey produced 15 sheep sightings. Game and Fish estimated the size of the herd at 50, plus or minus 30.

Hunting for other species--deer and javelina--is still allowed along Pusch Ridge. The pressure of seeing hunters wandering cross-country may have increased stress on bighorns there in the past. But now urbanization and recreational use alike have increased to the point where scarcely any hunters bother trying their luck in the area.

In 1978, when the Pusch Ridge Wilderness Area was created, the state was acquiring property adjacent to its northwest edge to form Catalina State Park. By 1985 more than 60,000 visitors a year were picnicking there, walking their dogs, hiking up the Romero Canyon Trail, and splashing in canyon pools. By 1995 the figure was up to 140,000 visitors a year.

Many of them were hiking into bighorn territory. So were day hikers in Pima Canyon and on other front range trails. Though the Forest Service issued regulations and posted signs prohibiting dogs from the backcountry, they were widely ignored.

Indeed, some UA studies have shown that recreationists pass the buck as much as anyone else. In a 1979-1980 survey, a majority of hikers said they personally had no impact on the sheep; a majority also said they believed other hikers did. In her recent study, Kelly observed backcountry use and found hikers going cross-country where signs requested staying on trails, and dog-walkers both taking their pets off-trail and ignoring Pima County's leash law.

In response to heavy recreational use, the Forest Service issued strict new regulations a year ago. Dogs were banned from prime sheep habitat. Unauthorized trails were closed. Group sizes were limited. Off-trail hiking and camping were restricted during the January-through-April lambing season.

Some protested. One Tucsonan, in a letter to *The Arizona Daily Star*, wrote that he'd been visiting the front range canyons since 1959 and never once had he seen a bighorn. "My dog," he wrote, "has more rights than these stupid, mythical sheep."

"Some people," says Bieber, "would rather see the sheep gone than deal with any restrictions." She says the general public's reaction to the new regulations--which are still in effect--has been positive.

It's not quite over yet. Sighting reports trickle in to the Forest Service and the Game and Fish Department. In November hikers reported seeing three sheep together on Pusch Ridge.

Bieber, for one, has not given up hope that a few sheep still remain, nor that the herd may yet be supplemented by immigrants from the Galiuro Mountains.

The herd there is a human product, the result of a reintroduction program in the 1980s. Its numbers seem stable. One of the rams released there, with a radio collar, found his way to Pusch Ridge in the 1980s. And last winter a ram of unknown origin was reportedly seen near Oracle, on what may still function as a wildlife corridor between the two ranges.

"We could still keep the corridor between the Catalinas and the Galiuros open," says Krausman. "But it would cost a tremendous amount of money to preserve all that land as open space.

The Estes Corporation used a bighorn in its logo even as its housing development helped finish off the herd.

"We could have done a lot in the past. But Tucson didn't care enough. The amount of money the Forest Service and Game and Fish put into sheep management was minuscule. It just wasn't a high-priority thing. People like to see the sheep and have them close by, but if you ask them to pay for it, forget it.

"It's a question of what we want as citizens, and what we give up as a result. We certainly didn't want to give up living in the foothills."

For years people have bandied about the idea of supplementing the Pusch Ridge herd with sheep brought in from elsewhere. In quite a few ranges reintroduced sheep have thrived. But without substantial habitat restoration and widespread adherence to severe recreation restrictions, adding sheep to the Catalinas would be pointless.

"Sure, you could have a viable herd there if it were supplemented every year or two with new transplants," says Etchberger. "But then it would be a zoo herd."

Biologists, meanwhile, are casting a wary eye on the Silverbell Mountains on Tucson's far northwest horizon. So far the bighorns there are persisting. So far. "We're concerned about that herd too," says Heffelfinger. "There's more and more recreational use out there, both off-road-vehicle use and hiking." There's also a giant ASARCO copper mine, though the bighorns are occasionally seen inside it. And modern homesteaders keep pushing houses toward the mountains.

"If we keep a close eye on the herd in the Silverbells," says Krausman, "we'll probably see the same thing happening there in 15 years." TW