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The Comeback Condors

by Jeffrey P. Cohn

It was a hot, dry August day and Allan Mee was exhausted. He and two colleagues had hiked in 100-plus degree heat through dense, thorny California chaparral, over a dry creek bed, and up a 40-foot waterfall to a remote canyon in Los Padres National Forest west of Los Angeles. Still ahead of them stood a high, sheer cliff with a grassy knoll where a four-month-old California condor (Gymnogyps californianus) was stranded. The chick, one of five hatched in the wild in 2004, had fallen from its nest on a ledge 200 feet above the knoll. From the way the chick held its wing, Mee knew it was broken.

After two unsuccessful attempts, Mee scaled the cliff face, reached the chick, taped its wings to prevent further damage, and carefully placed it in a folded cloth specially designed to hold condors. Then he slowly lowered the injured bird to his colleagues below. Completing the seven-hour rescue mission, the team retraced its steps out of the canyon to a waiting helicopter for a flight to the Los Angeles Zoo.

"We had to get that chick out of there," says Mee, a San Diego Zoo ornithologist who studies and monitors California condors in the wild. "I had watched that chick since before it hatched. It would have died if we had not been there. That would have been devastating. It's difficult not to get emotionally involved [with the condors]. I want to see those birds back out there as a viable species in the wild."

Once on the verge of extinction with no birds left in the wild, California condors are on the road to being a viable species once again. The condor population now totals 246, including 114 in the wild. Indeed, there are more condors in the wild today than at any time in at least 50 years. Nearly all of those birds have been hatched at captive breeding centers at the Los Angeles Zoo, San Diego Wild Animal Park, the World Center for Birds of Prey in Boise, Idaho, and most recently the Oregon Zoo in Portland. They have been released at nine separate sites in California and Arizona and one in Baja California in Mexico.

Further, the birds are following their species' old routes, exploring their old haunts, and finding some of their own food. They have even begun to breed and to fledge chicks in the wild. And they have done all that despite continued problems, dangerous juvenile behavior, and changes in how condors are raised and released into the wild. "Two decades ago we were not sure condors would make it," says Michael Wallace, a San Diego Zoo biologist and leader of the California Condor Recovery Team, an advisory panel to the U.S. Fish & Wildlife Service (USFWS). "It's been a slow process, but condors are tough. They're not doing too bad."

Not bad, maybe, but saving condors has not been cheap. The USFWS alone has spent more than $23 million since 1990 on the birds. Of that, $5.6 million went to The Peregrine Fund, which manages the Boise, Idaho, breeding center and the condor release program in Arizona. The Peregrine Fund has devoted $6.6 million of its own funds to the condor program since 1993. The San Diego Zoo has tossed in another $6 million. No figures are available for the Los Angeles Zoo.

Why anyone would want to save California condors might, at first glance, be a mystery. Admittedly, they are not much to look at. Unlike their cousins the Andean condors (Vultur gryphus) with their white neck fluffs, California condors are mostly a dull black. Their featherless heads and necks, oversized feet, and blunt talons are hardly signs of beauty or strength. And their carrion-eating lifestyle turns many people off.

That negative image vanishes when the birds take flight. With wingspans up to nine-and-one-half feet and weights up to 28 pounds, California condors are North America's largest fully flighted birds. In the New World, only Andean condors are bigger. California condors can soar almost effortlessly for hours, sometimes covering hundreds of miles in a single day. They need flap their wings only occasionally to take off, change direction, or find a band of warm air known as a thermal to carry them higher.

California condors once ranged from British Columbia in Canada south to Baja and east across the southern United States to Florida and New York. By the time Europeans reached California, however, condors were limited to the mountains along the Pacific Coast. By 1940, perhaps a hundred remained, all confined to a U-shaped region in the mountains and foothills north of Los Angeles. By the early 1980s they numbered but 21.

Why California condors almost disappeared is not entirely clear. Probably never plentiful anywhere, their numbers and range may have started to decline with the disappearance of such Ice Age behemoths as mammoths and giant ground sloths some 10,000 years ago. More recently, ranchers and hunters sometimes shot or poisoned condors, under the mistaken impression that the birds killed livestock. And, as Los Angeles and other California cities have

grown, suburban housing tracts, office buildings, industrial parks, strip malls, and roads have replaced the open range where condors often found food.

Worse, when scientists began monitoring and studying wild condors in the 1980s, they discovered that at least some of the birds were dying of lead poisoning. Condors and other scavengers sometimes ingest lead fragments from bullets in the carcasses of deer and other animals shot but not retrieved by hunters, or from gut piles left after an animal is cleaned. Lead can build up to lethal levels in the birds' bodies, unless people intervene and treat the condors with a chemical blood-cleaning procedure called chelation. At least three condors died due to lead poisoning in the 1980s.

The USFWS and several private groups launched a major effort to save California condors beginning in 1979. Land was set aside to protect the birds and other wildlife. A captive breeding program was started at the Los Angeles Zoo and San Diego Wild Animal Park with eggs and chicks taken from the wild. And systematic studies of wild and captive condors began. Nevertheless, when six of the last 15 wild condors died or disappeared between 1984 and 1985, USFWS officials decided to capture the remaining birds. The last wild condor was taken into captivity in 1987.

Based on studies of wild condors, scientists and zookeepers knew that if a pair lost an egg, the female would often lay another. To speed up reproduction—pairs usually produce only one chick every other year—keepers removed the first and sometimes the second egg each captive pair laid, artificially incubated them, and raised the chicks using hand-held puppets that resemble adult condors to minimize their familiarity with people. Condor parents raised the chicks from subsequently laid eggs. All told, 314 California condors have been hatched in captivity since 1988. More than 90 percent of those chicks survived to fledging.

With the captive population growing, captive-hatched California condors were released in Los Padres National Forest beginning in 1992. Unfortunately, those first releases did not go well. Five of the 13 released condors died, four from flying into power lines. Others, engaged in what Wallace calls "goofy teenage behavior," landed on houses and garages, walked across roads and airport runways, sauntered into fast-food restaurants, and visited picnickers and fishermen. Although these behaviors were dangerous, Wallace thinks they reflected the birds' innate curiosity. None of these condors suffered harm, and all remaining birds were recaptured in 1994.

Condor biologists and zookeepers decided to try something different. Rather than just releasing the condors, they conditioned the birds to stay away from people and power lines. The keepers made any contact with humans a nasty experience and wired wooden poles in the enclosures to shock any condor landing on them. Later, instead of being raised solely with others their own age, condor chicks were socialized into a group that included adult birds. The adults served as role models for the chicks, pecked at them to keep the youngsters in their place, and discouraged juvenile misconduct.

It worked. Beginning in 1995, condors were released into the wild again at Los Padres. Later releases came in the Ventana Wilderness Area and Pinnacles National Monument in central California, along the Vermilion Cliffs north of the Grand Canyon in Arizona, and in the 10,000-foot-tall San Pedro de Martir Mountains in Baja. Altogether, 185 California condors have been released in the wild, with 114 still flying free.

While problems remained, the released birds exhibited fewer juvenile tendencies, especially as the older ones reached sexual maturity and their interests changed. These birds, along with some older condors captured in the 1980s that were no longer needed for captive breeding and were later restored to the wild, now serve as mentors to more-recently released birds. Additionally, condors are now released when 18 to 24 months old, not six as before.

Today, the wild condors are mostly acting like, well, wild condors. In 1999 one Los Padres female flew 160 miles to the north and found the Ventana condors. Two years later the Ventana birds began flying south to Los Padres. Now, birds from the two populations freely go back and forth to visit one another. Two Ventana females have even mated with males from and established nests in Los Padres. The chick with the broken wing hatched in one of those nests. It is scheduled to be released in 2005. Showing that old ties are not forgotten, both females revisit Ventana on occasion. In their travels, the birds have discovered many of the canyons, roosting and nesting sites, and feeding areas used by condors for millennia.

Meanwhile, Los Padres condors have flown 150 miles east following the San Rafael, San Gabriel, and Tehachapi mountains to the Sierra Nevadas in eastern California, an area once regularly visited by condors. Similarly, the Arizona condors freely move throughout the Grand Canyon as well as north to Zion National Park in southwestern Utah and east to the Fort Apache Indian Reservation in eastern Arizona. Some condors stay away for days or weeks. One daring Arizona female even undertook a 620-mile, 12-day round-trip flight from the Vermilion Cliffs to Flaming Gorge National Recreation Area in southwestern Wyoming and back.

Moreover, the released condors are now finding at least some of their own food. It's a great achievement, but it exposes the birds to lead poisoning. Researchers and field technicians still provide carcasses, mostly stillborn calves donated by local ranchers, to ensure that the condors get clean, lead-free food. Notwithstanding the handouts, deer, elk, coyotes, beaver, and livestock carcasses now make up at least 15 to 20 percent of the condors' diet in Arizona, says William Heinrich, The Peregrine Fund's species restoration manager.

Most important for restoring the species

to the wild, the free-flying condors have begun to lay eggs and raise chicks. Indeed, a chick that hatched in 2003 on a remote ledge in the Grand Canyon in Arizona was the first condor to fledge successfully in the wild in two decades. Three more chicks successfully fledged last year, one in California and two more in Arizona. Also surviving at the Los Angeles Zoo is the wild-hatched chick with the broken wing. Beyond hatchlings and fledglings, no juvenile or adult condor has died in the wild since October 2003. Only one had to be recaptured because of behavioral problems since 2001, says Jesse Grantham, a USFWS senior biologist.

Despite these successes, problems remain. Of the 18 eggs laid in the wild so far, only six chicks survived. Most died after their parents fed them bottle caps, glass shards, pieces of plastic, and other man-made objects that fatally perforated or blocked their intestines. No one knows why. Perhaps the inexperienced parents simply did not know better. Maybe condors are naturally curious birds that investigate and pick up objects. Or the adults may mistake man-made objects for bone chips fed to chicks for their calcium content. Biologists at Los Padres have added bone chips to the condors' food since 2002.

Another problem relates to human hunters and urban sprawl. Hunters have shot at two released condors. One of those birds, called AC-8, was one of the last wild condors taken into captivity in the 1980s. She was killed during a sponsored hunt in 2003 at El Tejon, a 272,000-acre ranch north of Los Angeles scheduled for development. The hunter, who had bragged of his success, was fined, lost his hunting license, and had his guns confiscated. Also, the developers of El Tejon have promised to limit housing density near condor ledges, create a 37,000-acre condor study area, and hire a wildlife biologist to help track and protect the birds.

The most serious problem, however, remains lead poisoning. Virtually all wild condors have detectable lead levels in their blood, presumably from lead bullet or shot fragments. More than 60 percent had higher than normal amounts while 15 percent had potentially fatal levels that required immediate treatment, says Michael Fry, an environmental toxicologist and senior scientist at Stratus Consulting in Boulder, Colorado. Beyond the three condors killed by lead poisoning in the 1980s, four others released into the wild since 1995 died after eating lead fragments. Twenty-six others had to be recaptured and treated. They recovered and were later re-released. "The condors won't be truly self-sustaining until we have a lead-free environment," says Michael Stockton, a USFWS biologist.

Toward that end, the service has issued brochures and posters, and talked with individual hunters in California about how to keep condors and other wildlife lead-free. More recently, USFWS officials began working with other federal and state agencies, wildlife organizations, and hunting and shooting groups. The multi-year program is using focus groups to help develop educational materials, package inserts to accompany hunting permits, and magazine, newspaper, and newsletter articles. The program encourages hunters to switch to copper or other nonlead bullets and shot. A similar effort is under way in Arizona.

For hunters who still use lead bullets, the campaign will encourage them to find and clean any deer or other animals they shoot, and bury gut piles so condors and other scavengers do not find them. "We do not want to alienate hunters," says Marc Weitzel, the USFWS' condor project leader and manager of Hopper Mountain National Wildlife Refuge, where most Los Padres condors have been released. "We want to make the hunting community an integral part of the condor program. They are one of our partners."

Whether such voluntary efforts are enough to produce a lead-free environment in which condors no longer need to be fed by biologists remains uncertain. "Little or no progress has been made in resolving the lead problem," Fry states. Jeffrey Miller, the Center for Biological Diversity's wildlands coordinator, agrees. "Voluntary measures clearly won't do it all," Miller says. "It doesn't make sense to release condors into the wild without addressing the lead problem. It could negate the whole recovery effort."

Using its authority to regulate migratory birds, USFWS banned lead shot for waterfowl hunting in the 1980s. But the agency has no legal authority to outlaw lead bullets for deer hunting or lead shot for small animals, Weitzel says. Only state governments possess that power. The Center for Biological Diversity has petitioned the California Fish and Game Commission to require non-lead ammunition for deer and other hunting. Attempting a ban would be a "huge political and social challenge," states Mike Scott, a University of Idaho research scientist and former condor project leader.

For their part, hunters are ready to help protect condors from lead poisoning when they hear the right message from the right people, says Rick Patterson, executive director of the National Association of Shooting Ranges, a gun industry group. Can a voluntary program work? "Absolutely," says Patterson, if it is long-term. "Hunters have helped bring back a number of endangered species." The primary obstacle, though, remains the higher cost and aerodynamic deficiencies of nonlead bullets.

Problems aside, scientists have made several interesting discoveries studying condors, both in captivity and in the wild. One was the observation that young condors have to be socialized into a diverse group that includes others their age, older juveniles, and adults. Newly fledged chicks naturally take their behavioral cues from older birds. With no older condors in the wild, the newly released birds, all usually in their first or second year, had only each other to emulate. "Adults provide leadership and direction on a basic social level," Wallace says.

Another finding concerns the bonds that

scientists assumed adult condors formed as they paired upon reaching sexual maturity at about age six or seven. Common wisdom held that condors formed monogamous pairs that remained stable for life. Not necessarily so, says Mee, the San Diego Zoo ornithologist. In fact, young condors may be more promiscuous and deviate from the norm more often than previously thought.

The first hint that this might be the case came in 2001 when one wild condor male paired with not one but two females, both of whom laid eggs. The only other previous record of such a ménage a trois occurred at the Los Angeles Zoo. With only one male to help incubate two eggs, the field biologists removed both eggs from the nest and took them to the Los Angeles Zoo for hatching. One of the females has since left that male and found another mate.

In fact, both male and female wild condors often have sex with condors other than their mates. Mee says 23 percent of all condor matings in the wild took place between a paired bird and a bird that was not its mate. Among other bird species, the highest known occurrence of what wildlife biologists call "extra-pair" mating is seven percent. The birds' youth, the tenuous nature of early pairings, and either the male or female seeking another mate after the current one proves unable to raise chicks may explain extra-pair mating among condors. Or it may have something to do with social stature. Mee notes that 75 percent of the known extra-pair matings or displays are done by the highest-ranking male and most of the rest by the second highest.

Whatever the reason, the promiscuous sex lives of some wild condors could affect continuing efforts to save the birds. Wildlife biologists and zookeepers maintain meticulous records on all condors, including their parentage. That helps ensure as genetically diverse a population as possible given the few condors from which all of today's birds descend. Now, though, knowing who fathered which chicks may be more difficult, especially when no observers are present to record matings. It may also mean that only a few males are siring most of the wild chicks, potentially reducing genetic diversity.

In the end, the condors are beginning to approach the recovery program's stated goal of a self-sustaining wild population of 150 birds in each of two sites—southern California/Baja and Arizona—plus another 150 in captivity. Still, "we have a long way to go," notes the USFWS' Stockton. "We saved those birds from extinction, but we won't know whether we've successfully restored them to the wild for many years," he says. "I hope so. Those wild condors are beautiful animals."

—Jeffrey P. Cohn is a freelance writer who lives in Takoma Park, Maryland, and specializes in conservation subjects.

This is Topatopa, the first California condor taken into captivity. (Spencer Weiner/ USFWS)

A California condor. (*Nick Todd/ USFWS*)

California condors feed at a USFWS refuge. (Ana Fuentes/ USFWS)