

# A Raptor Rebounds

By Eric Hoffman



Twenty years ago the peregrine falcon appeared headed for certain doom.

Alan & Sandy Carey

## Keep pollution in check and the sky's the limit for peregrine falcons.

Biologist Brian Walton smiles broadly and jokes about the gray hair acquired during his 17-year stint on the University of California (UC), Santa Cruz, campus, where he heads the Predatory Bird Research Group. Walton ought to be happy. He's been a key player in saving the fastest bird in the world—the peregrine falcon—from extinction.

If his many struggles to restore peregrines brought that graying around the temples on a bit prematurely, it was worth it. His captive-breeding program was so successful in restoring the falcon to California, Washington, Oregon, and Nevada, it will cease this spring. Only a scaled-back monitoring program will continue. Though questions remain about the bird's long-term survival, the foreseeable future appears to be very bright. "I don't know many scientists working with an imperiled creature who are in my position," explains Walton. "Our endangered species has recovered throughout most of its range."

In 1975, when Walton came on the scene, things were bleak indeed for the peregrine. A 1970 census uncovered no breeding pairs east of Mississippi and only two breeding pairs in the West. The bird was federally listed as endangered in 1972.

The effects of the pesticide DDT were identified as the main cause of the peregrine's slide toward oblivion, but developing the expertise and techniques to turn things around was uncharted territory.

Despite this, the Santa Cruz Predatory Bird Group and similar programs nationwide have had phenomenal success. Working from donated captive birds, the Santa Cruz program was launched with one female peregrine and three males. With hatchlings from this group and from collected eggs that would have cracked prior to hatching in the wild, Walton set a goal of introducing 500 peregrines back into the wild. This would include 120 confirmed breeding pairs—the number judged sufficiently safe by the U.S. Fish and Wildlife Service (USFWS) for the species to maintain itself.

Persistence paid off. By 1992, the Santa Cruz project has released 743 peregrines in California, Washington, Oregon, and Nevada, with 122 confirmed nesting pairs in California and another 25 nesting pairs in the other three western states. Even in pristine times, experts estimate, there were only about 300 nesting pairs in California.

Undoubtedly the peregrine's success story required a great deal of commitment plus scientific and technological innovations. But the key to long-term success may be the amazing adaptability of the birds themselves.

Peregrines are now nesting in skyscrapers in Los Angeles, San Francisco, New York, Denver, Baltimore, Washington, D.C., and other large cities. "This ability to

coexist with humans is a real advantage for long-term survival," says ornithologist Patricia Zenone, the education coordinator for the Santa Cruz group. "A peregrine seems equally at home plucking pigeons from between buildings in the financial district in San Francisco as it is snatching a coot over a remote marsh in Northern California."

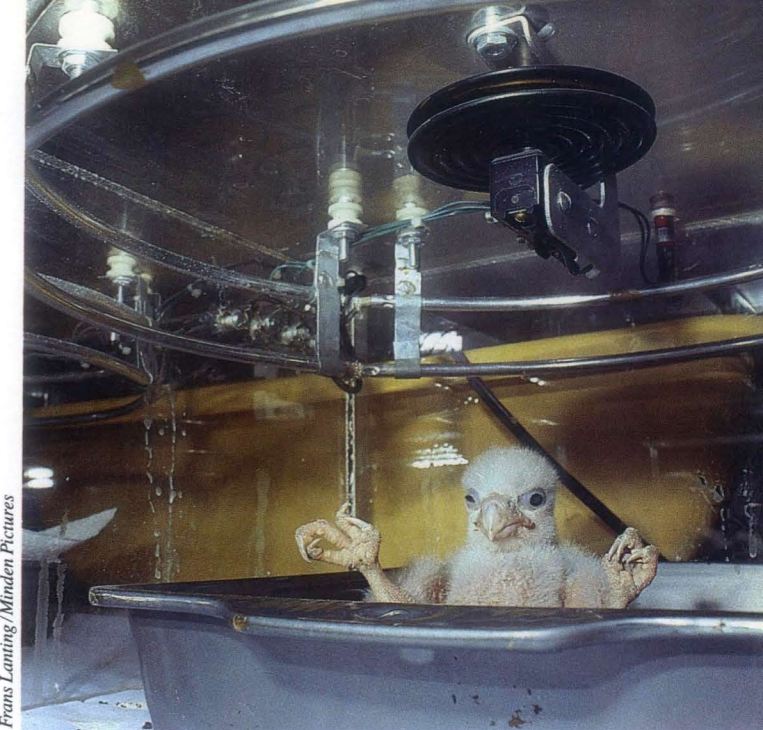
A million years of evolution has equipped the bird with phenomenal hunting skill. At first look, a peregrine's physical attributes appear modest. It usually weighs less than three pounds and possesses a 30-inch wingspan, but has the curved beak and taloned feet of all raptors. A peregrine's advantage is, in part, its aerial acrobatic ability. But, more impressively, it is incredibly fast—capable of overtaking other birds in sky dives close to 200 miles per hour before throttling back for a spectacular midair collision. Large talons clench into lethal fists that pound its prey senseless in a split second and then open to snatch it as it plummets toward earth. With extrasensory eyesight (by human standards equivalent to being able to read a newspaper from a distance of 300 yards), the peregrine is an awesome hunting bird.

But this master of the sky could not cope with a poisoned environment. By 1946, DDT was in wide use throughout the United States. To some animals this meant an increase in deformities, abnormalities, and stillborn offspring. But to the peregrine, which ingested DDT accumulated in the tissues of prey species, it was much more deadly. The falcon's metabolism turned DDT into DDE, a substance that inhibits an enzyme associated with calcium production

DDT in the raptor's food chain resulted in thin-shelled, damaged eggs. Here, the difference between a healthy egg (left) and a poisoned one is apparent.



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Program staff monitored wild nests and removed thin-shelled eggs for incubation. This not only saved the chicks but stimulated parents to produce more eggs.

for the eggshell. Excessively thin-walled eggs cracked before a chick could be hatched. Complicating the picture was the fact that DDT takes years to dissipate once it contaminates the food chain. Eggshells had been thinning for years, but the severity of the problem wasn't understood until the entire species had accumulated levels so high that nesting activities failed throughout the species' entire range.

Although DDT was banned in the United States in 1972, the birds still showed no sign of recovery two years later. To make matters worse, solitary, surviving peregrines were feeding on migratory birds that traveled from Latin America, where DDT was still in wide use. Most experts saw certain doom for the peregrine.

Santa Cruz veterinarian James Roush and UC Santa Cruz Professor Ken Norris were among a small group of falconwise people across the United States who thought otherwise. Spurred on by Cornell University's Tom Cade, who started a New York captive-breeding program in 1970, Roush and Norris began incubating a program idea of their own. With only a theoretical blueprint for how it would work, they convinced university officials to allow a facility on campus.

Operating on meager funds from concerned private donors and scant federal sources, a spartan plywood facility designed to approximate nesting conditions for falcons was constructed in an abandoned quarry at the end of a dirt road, out of sight from daily university activities. Aligning themselves with efforts in New York and Colorado, the facility realized extra funding by joining a national effort known as The Peregrine Fund.

In 1975, biologist Brian Walton was hired to direct activities on a full-time basis. "When I arrived there were more unknowns than knowns," recalls Walton. "We didn't know if falcons could adapt the courtship behavior we'd seen in the wild to the more restrictive environment of captive

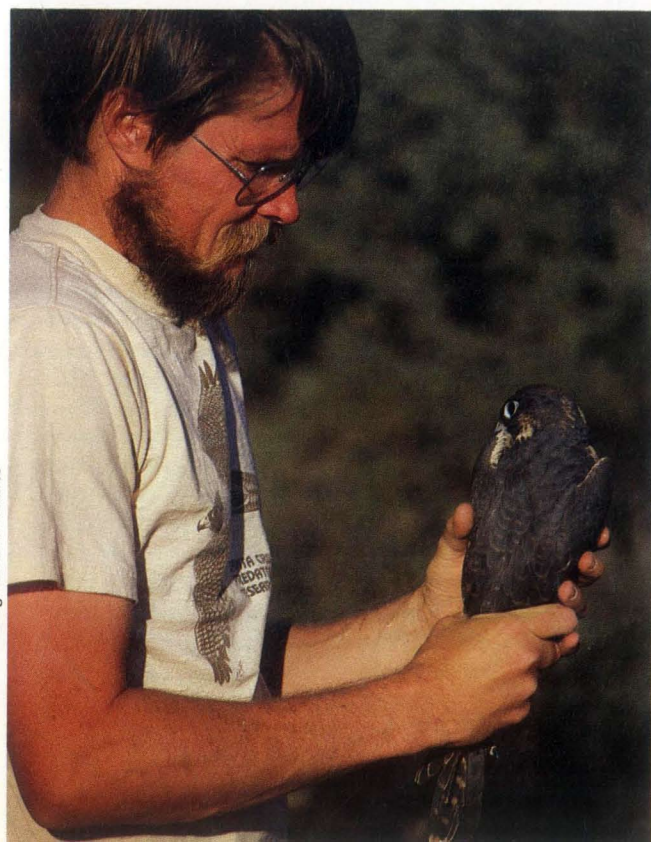
## 'It's time to see how the birds do with less human involvement.'

breeding. We had to design portable incubators for extremely fragile, thin-walled eggs. We needed to learn more about the humidity requirements of developing eggs. We had a lot of questions and not enough answers."

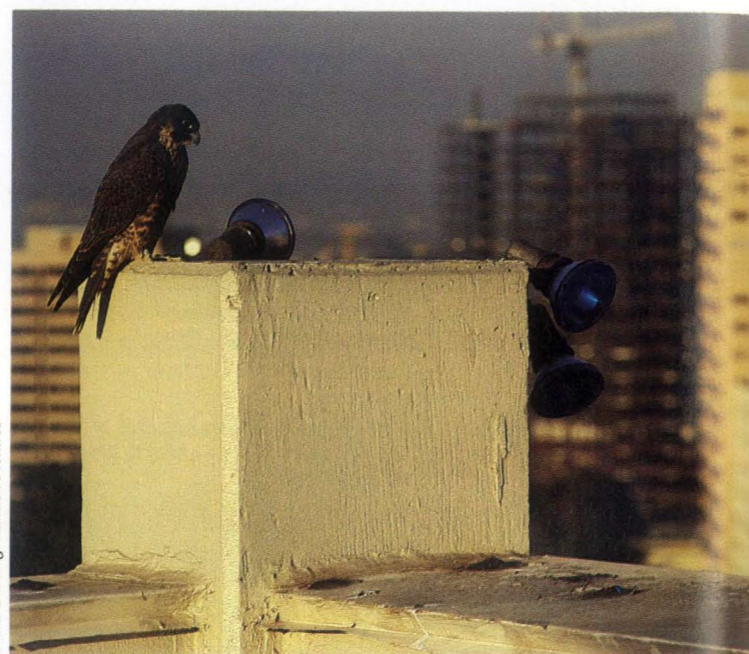
Walton pulled out all the stops: innovating when necessary, conscripting scientists with skills needed for the peregrine cause, and adopting a multifaceted approach that required devising a myriad of clever manipulations.

When a nest was located in the wild, it was watched carefully until the customary four eggs were laid. The eggs were then taken and replaced with dummy replicas, often made of fiberglass, which ensured that nesting activities continued. The collected eggs were rushed to the Predatory Bird Research Group facility, where they were incubated and hatched. Because falcon hatchlings, like any chick, are very fragile and can quickly succumb to adverse weather conditions, predators, and falls, chicks were raised at the center until, at about two weeks of age, they were robust. Then they were often returned to the nests of wild birds that had dutifully been sitting on dummy eggs. For forays to peregrine nests, Walton enlisted a select group of young biologists with mountain-climbing skills.

**Brian Walton, head of the Predatory Bird Research Group at the University of California, Santa Cruz, holds a young peregrine about to be released.**



Frans Lanting/Minden Pictures



Frans Lanting/Minden Pictures

**The peregrine's ability to live in urban habitats, such as on these Los Angeles skyscrapers, has been one key to its recovery.**

Great care was taken that chicks relied on falcons rather than humans, ensuring their wariness toward people. Luckily, falcons are blind at birth. This allowed Walton and his team a few days to carefully monitor each nestling's eating habits and development before turning it over to captive birds or, more commonly, to wild peregrines who were diligently and unknowingly waiting on dummy eggs that would, with a little help from the team, yield captive chicks.

**C**limber Roy Rob Ramey III, who was active in the program during the 1980s, recalls the drama of exchanging dummy eggs for live chicks while suspended hundreds of feet above ground. "I was always aware of my precious cargo," he says. "My mind constantly juggled concern for the birds' and my own safety. Often the adult falcons began dive-bombing me when I got near their nest."

Double clutching was tried with some of the nesting falcons, meaning that the team would swipe eggs from the same nest twice in a single breeding season. Usually, if the first group of eggs is taken early in the nesting cycle, the female lays a second clutch. In this way, the team could double the natural egg production. Thin-walled eggs that rarely hatched in the wild could be saved.

So, through Walton and his wife Cheryl's vigilant incubation activities—which included helping weak chicks chip their way out of eggs—90 percent of the eggs under their care hatched.

The adult captive birds fit nicely into the chick-raising phase of the program. If they didn't have their beaks full caring for their own nestlings, they became surrogate parents.



Frans Lanting/Minden Pictures

**Biologists with mountain-climbing skills brought captive-raised chicks to the nests of wild birds.**

As fast as possible, Ramey would make the exchange, taking extra care to place the chicks away from the ledge. "The falcons stared in disbelief at their newly hatched chicks, then swooped down to inspect them," Ramey remembers. Usually in a matter of minutes they'd be dotting over their noisy nestlings, and the male would race off to find food for the family.

No less important, though a lot less glamorous, than scaling cliffs was the hack-box part of the program. Designed for reintroductions, hack boxes serve as halfway houses for young falcons. Made of plywood and about the dimensions of a refrigerator, the hack box is suspended on the cliff face and is open on one side so the peregrine can come and go. Students camping on top of the cliff supply food through a tubular chute and provide sentry duty against great horned owls, raccoons, and other predators. As the young raptors develop their hunting skills, attendants slowly wean them. "The boxes have increased the survival rate of captive-raised birds released to the wild to 90 percent," notes Zenone.

With 15 breeding pairs in the captive population, more than 100 eggs a year could be realized if everything, including double clutching, went right. Artificial insemination techniques were also developed, using male birds imprinted on people. One such bird was Juan Carlos, who was donated to the center by a falconer. Juan Carlos would court selected people. A human suitor wearing a weird leather hat that looks like something worn by an Arab sheik would enter his enclosure, emit a falconlike call, and gesture by bowing to Juan Carlos. If aroused, the bird would return the call and prance about before alighting on the hat and

ejaculating, allowing the collection of semen. "Juan Carlos was exceptional," explains Zenone. "He wasn't shy and would perform many of his chores with a TV crew sharing his space during courtship."

**B**y the mid-1980s, the program was clearly sophisticated. Egg thickness could be analyzed from wild nests to assess the amount of DDT in a particular female bird and the precise likelihood of her eggs' surviving nesting activities. Incubation techniques were also refined. The door was now opened for new challenges with such other troubled raptor species as the elf owl, aplomado falcon, and Harris hawk.

As for the future of the main project, the peregrines, there are still some unanswered questions. A disproportionate number of peregrine eggs in recent years, especially in southern California, have had the membrane lining the shell separate and collapse, killing the developing embryos. Walton speculates, "It's something that wasn't here 40 years ago. It may be chemical in origin, possibly a poison that accumulates that we don't understand yet."

Still, the peregrine's future looks so bright Walton sees his own future in the smaller monitoring program—not in a breeding program anymore. "The big picture is 50 times better than any of us would've imagined was possible 15 years ago," he says. "It's time to see how the peregrines do with less direct human involvement."

*Author Eric Hoffman writes frequently for Animals and other publications on wildlife and related subjects.*