

THE PEREGRINE FUND

A man with grey hair, wearing a dark blue North Face jacket, is holding two white and brown speckled birds of prey. He is looking directly at the camera with a slight smile. The background is a bright, overcast sky.

WORKING
TO CONSERVE
BIRDS OF PREY
IN NATURE

FALL/WINTER 2006

NEWSLETTER NUMBER 37

UNITED STATES INTERNATIONAL

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THE PEREGRINE FUND

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On the cover: Bill Burnham holds two Gyrfalcons during 2004 research in East Greenland.

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Thank You, Bill

(1947–2006)

William A. Burnham, our President and leader for the past 23 years, has died at the age of 59 after a brief battle with cancer. What can one say about a person who dies before his time? In Bill's case quite a lot.

We all die; "therefore," as John Donne cautioned, "never send to know for whom the bell tolls; it tolls for thee." How long we live is not as important as how well we live—how much we contribute to the good of humanity and to the welfare of the earth, the sustainer of all life. Bill Burnham made outstanding contributions to the preservation of his beloved birds of prey and other wildlife, and to nurturing the habitats they require. Therefore, we should not mourn but celebrate his life and move forward, strengthened by our association with him and thankful for all he has done.

Bill became associated with The Peregrine Fund (TPF) in 1974, after receiving his MS degree at Brigham Young University under Prof. Clayton White. That summer, Jim Weaver met him on a field trip to western Greenland. Hiking and camping with Bill in the arctic wilderness, Jim became greatly impressed by his stamina in the field and by his eagerness to face up to hard challenges. Jim recommended that TPF hire Bill to head up a new program of captive breeding and reintroduction of Peregrines that we were just starting in collaboration with the Colorado Division of Wildlife to restore falcons in the Rocky Mountains.

On Christmas eve of 1974, Bill and his wife, Pat—soon to be joined by a son, Kurt—moved into some rooms on the second floor of an old game farm facility the Colorado Division of Wildlife made available for TPF use on the outskirts of Fort Collins. Kurt was born in May, 1975 at the same time the first baby Peregrines were hatching. Pat not only mothered her child, she also cared for many young falcons over the years and always remained the person Bill relied on most for running The Peregrine Fund. Bill quickly attracted several skilled and dedicated associates to help with the breeding and release of Peregrines. Two of them, Bill Heinrich and Cal Sandfort, are still with TPF 31 years later.

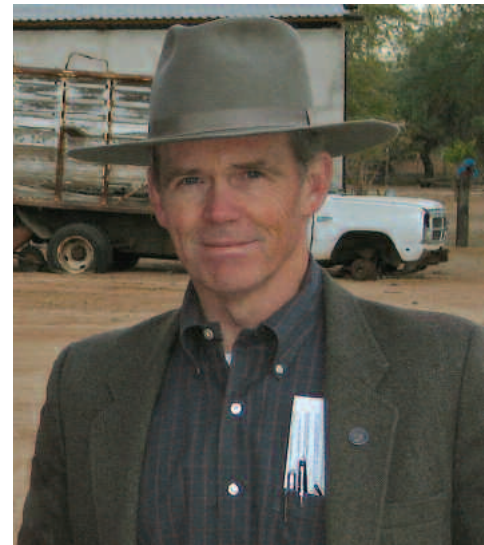
By the 1980s the Fort Collins team, under Bill's supervision, had produced hundreds of Peregrines and had released them in several Rocky Mountain states and in the Pacific Northwest. At the same time all this intensive work was underway, Bill somehow managed to earn a Ph.D. degree from Colorado State University without ever taking time off from his job. Bill's effectiveness in managing the western operations did not go unnoticed by the fledgling board of directors of TPF. In 1977 he was elected to the board of directors, and in 1982 he became the fifth "Founding Member" of the board, joining Bob Berry, Frank Bond, Tom Cade, and Jim Weaver.

When TPF had an opportunity in 1983 to consolidate its eastern program at Cornell University and its western operations into one facility, Bill was put in charge of finding a location, constructing the new campus, and making the move. At the same time the directors decided to expand the mission of The Peregrine Fund to embrace work on birds of prey worldwide. Through Bill's leadership and ability to organize the volunteer efforts of many falconers and raptor enthusiasts, members of the business community, and government agencies into a unified and productive endeavor, the World Center for Birds of Prey came into existence on a hillside overlooking Boise, Idaho, in 1984. The site was dedicated in May, construction began soon after with much comradeship and enthusiasm, and the birds from Fort Collins were in their new quarters before the next breeding season in 1985. The Cornell birds followed a year later.

It quickly became clear to the small group of directors that TPF's expanded global mission would require a much bigger board of influential people and a strong and determined chief executive. Bill became President in 1986, and he began to build a more active and diverse board of directors, including people from the business world, scientists, and conservationists. Through Morley Nelson's introductions, he began to establish personal relationships with local business people in the Boise community, meeting weekly with some of them for breakfast and discussion. Several joined the board and brought some of their friends along. Our vice presidents, Jeff Cilek and Peter Jenny, whom Bill wisely chose to help him, made important additional contacts, as did Frank Bond and Bob Berry. Currently the board consists of more than 30 members, and it is considered to be one of the strongest boards of a non-profit, conservation organization in the country, thanks largely to Bill's ability to forge personal ties with influential and supportive people.

The combined fund-raising abilities of Burnham, Cilek, and Jenny, and their equal facility in dealing with government bureaucrats and legislators, were beautiful to observe in action. They allowed TPF to move beyond its original focus on the Peregrine and to take on many other projects around the world, although we had been involved previously in cooperating with Carl Jones on restoration of the Mauritius Kestrel.

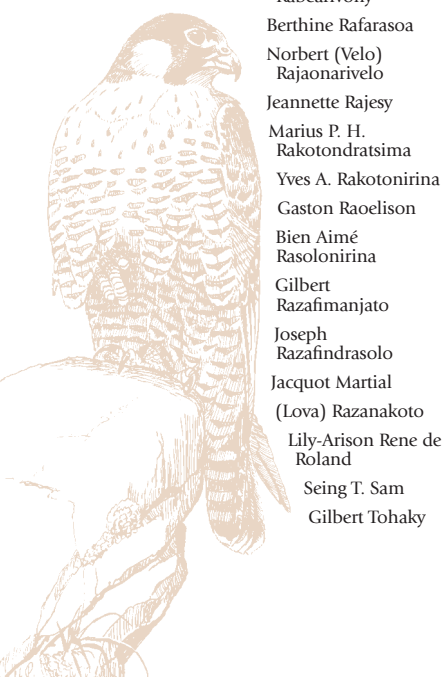
The first major effort was the "Maya Project," which grew out of Pete's and Bill's interest in the Orange-



Ben Widener

... he wisely left us with the capability to move forward without him, but ever in memory of him.

(continued on page 2)



Thank You, Bill (continued from page 1)

breasted Falcon, a rare species of the Neotropics. Located in Tikal National Park, Guatemala, the fieldwork for the Maya Project was headed up by Dave Whitacre with several assistants, notably Russell Thorstrom, and included local Guatemalans. Carried out over several years, the project resulted in new scientific descriptions of the life histories of more than 20 species of tropical raptors and a detailed analysis of their community ecology, as well as studies on Neotropical migrants and the training of a number of Guatemalan biologists.

In 1990, a comparable project started up in Madagascar and continues to the present, under the supervision of Rick Watson, again with impressive fieldwork by Russell Thorstrom. It has focused on the ecology of the rare and endangered raptors found only on the island, notably on the Madagascar Fish Eagle.

The list of overseas projects quickly expanded under Rick's supervision as International Programs Director, including activities in Africa, New Guinea, Mongolia, Pakistan and India, and Latin America. In Hawaii Bill set up a program for the captive breeding and reintroduction of endangered bird species unique to the islands and oversaw the development of two breeding facilities. Under the management of Alan Lieberman and Cyndi Kuehler, this program was later transferred to the Zoological Society of San Diego. Bill also established a new branch of The Peregrine Fund located in Panama City—Fondo Peregrino-Panama, and supervised the construction of the Neotropical Raptor Center to carry out research and conservation involving raptors of Latin America and the Caribbean, again emphasizing rare, little-known, and endangered species, such as the Harpy Eagle, Orange-breasted Falcon, and Ridgway's Hawk.

One of the most important but least heralded accomplishments spearheaded by Bill was the discovery of the cause for the "Asian Vulture Crisis"—the virtual extinction of three species of griffon vultures on the Indian Subcontinent in just the past decade. In collaboration with a former associate of TPF, Lindsay Oaks, now a veterinarian specializing in avian virology at Washington State University, TPF biologists obtained conclusive proof that a veterinary drug called diclofenac was fatal to vultures that fed on carcasses contaminated with this chemical, which had become widely used on the Subcontinent as an analgesic and anti-inflammatory for domestic livestock. In 2006, as a direct result of this discovery, the governments of India, Nepal, and Pakistan banned the use of diclofenac for veterinary purposes. This achievement is in many ways equivalent in importance to the banning of DDT in the United States in 1972. Recovery of the vultures is now a possibility.

The study of Peregrines and Gyrfalcons in Greenland was Bill Burnham's favorite project. His first trip to Greenland was in 1972 when Bill Mattox started the Greenland Peregrine Survey, which on Mattox's retirement in 1998 he transferred to TPF. Burnham expanded the project to include Gyrfalcons and the prey species falcons eat, and with help from his son, Kurt, established the "High Arctic Institute" at Thule, using a decommissioned facility leased from the U.S. Air Force. Father and son worked together in Greenland each summer for the past 16 years, along with many other associates. Bill was able to fulfill his last wish by making two trips to Greenland in the summer of 2006, despite an incapacitating illness that would have kept anyone else in hospital.



Lucy Widener



File photo

Since the removal of the Peregrine from the list of endangered species in 1999, an accomplishment that involved Bill and other TPF staff in negotiations with the federal government for more than five years, our two main domestic projects have been the use of captive breeding and reintroduction to restore nesting populations of Aplomado Falcons in the Southwest and California Condors in northern Arizona. By negotiating use of the "safe harbor" policy for private landowners in Texas and the non-essential experimental population designation under section 10(j) of the Endangered Species Act for condors in Arizona and falcons in New Mexico, Bill quietly but effectively maneuvered TPF through a tangle of political and societal issues that initially impeded the development of these projects.

Believing strongly that public education and academic training are the keys to successful conservation, Bill promoted projects such as the Velma Morrison Interpretive Center, which welcomes thousands of visitors each year, and the Gerald D. and Kathryn S. Herrick Collections Building. The latter houses a major ornithological library, egg and specimen collection, and the Archives of Falconry. Both facilities attest to Bill's commitment to education, as does TPF's support over the years of more than 20 Doctoral degrees, 53 Master's degrees, and numerous Bachelor degrees and high school diplomas earned by students around the world.

Bill also participated in many activities external from but related to TPF interests. For example, he helped establish a unique graduate program in raptor biology at Boise State University (BSU) and became an adjunct professor in the program, supervising a number of students who carried out research associated with TPF projects. Secretary of the Interior Emanuel Lujan appointed Bill to the National Public Lands Advisory Council; he also served as a trustee on the BSU Foundation; as a conflict mediator and then member of the Bureau of Land Management's Oversight Committee for the Snake River Birds of Prey Area; on the council for the multi-agency and university Raptor Research and Technical Assistance Center at BSU; on the board of the North American Raptor Breeders' Association; on the advisory board of the Walt Disney Company's Animal Kingdom; as an adviser to the Philippine government on science and conservation for the Philippine Eagle; as a board member of the Philippine Eagle Foundation, Inc; and in various other similar capacities.

He was elected to be a "Fellow" of the Arctic Institute of North America and of The Explorers Club. He was also presented



Kurt K. Burnham

with The Explorers Club's Lowell Thomas Award in 2004. In 2006 he was chosen to receive the Conservation Medal of the Zoological Society of San Diego in recognition of his many contributions to the conservation of birds of prey.

I knew Bill for 32 years and watched in admiration how he developed as a person and crafted The Peregrine Fund into an outstanding organization. Bill was the quintessential workaholic, an early riser, often in his office before 6 a.m. and putting in many seven-day weeks. He was a natural-born leader, attracting many good and loyal people to work with him. He viewed his position as President to be one of making the big, strategic decisions, and he left his associates free to handle most of the tactical, day-to-day things. Consequently, he empowered a strong, well-organized group of people to carry on after him.

Bill worked hard, but he also played hard. He was not a large man, but he had great body strength and great endurance. His stamina in hiking and backpacking was legendary. On hikes in Greenland looking for falcon eyries, he was always ahead and would be set up in camp brewing coffee by the time the rest of us straggled in.

Danger excited and challenged him. He actually enjoyed rappelling on a rope hundreds of feet down cliffs to enter falcon eyries. You can read his account of one such climb on a karst cliff in Guatemala in search of the nest of the Orange-breasted Falcon (page 189 in his book *A Fascination with Falcons*, 1997). Once in a

Clockwise, Bill duck hawkking with his female Peregrine Falcon, Ebony, near Sheridan, Wyoming, in 2004; with his son Kurt conducting Peregrine Falcon surveys near Kangerlussuaq, Greenland, in the summer of 1992; and with his best friend Pete Widener antelope hunting near Buffalo, Wyoming, in the fall of 2005.

All gifts received in memory of Bill will be placed equally in the general endowment for The Peregrine Fund and the endowment for The Archives of Falconry.

campfire discussion, we both agreed that one of the things that makes true wilderness so exciting is the possibility of being eaten by a grizzly bear. Remove the bear—no more wilderness.

Bill was an avid falconer, especially in his earlier years. When he became President of TPF he selflessly reduced his practice of falconry, a time-consuming avocation, so that he could devote more attention to the needs of the organization. He did continue to hunt big game seasonally, often with his close friend, Pete Widener, and more recently, upland game birds with Kurt and other companions. I know it was one of his great joys to return to falconry in recent years.

Although Bill had the reputation of being a practical, rough-and-ready, can-do, let's-get-it-done-now, sort of guy, he also revealed a more philosophical and meditative—even poetic—side to his character from time to time. Some of his reflections on the need for conservation and the value of wild animals and wild places in his book, *A Fascination with Falcons*, reflect a deep devotion to nature. I especially like his short essay on "The Scent of a Peregrine" published in *Return of the Peregrine* (2003, p. 222), a book he conceived and helped edit: "There is nothing in the world that smells like a newly captured Peregrine. She smells like a mix of willow and birch of a green arctic tundra, the scent of pine as the rays of the sun pierce the forest to dry the needles of the morning dew, the freshness of the golden prairie grass on an autumn day, and the fragrance of the sea breeze through marsh flowers."

Bill loved to explore new places and to test his endurance against hardships. One of my strong memories of him is how he stood stalwart and confident at the controls of our "Safe Boat" with Kurt by his side, as we faced into a gale and icy rain, while traveling up the west coast of Greenland with icebergs passing to port and starboard. Jack Stephens and I crouched in the back of the open boat, huddled in our rain parkas trying to keep from freezing to death, while Bill and Kurt faced the brunt of the storm during hours of hard travel to reach a safe harbor.

When traveling under such conditions, I tend to enter a kind of sleepy lethargy, and all sorts of random thoughts and images drift through my groggy consciousness. Once I glanced up and saw Bill still at the wheel, and some words from history came to mind: "There stands Jackson like a stonewall." I then realized that our "Safe Boat," said to be unsinkable, was safe not so much because of its design as because of who was at the helm.

One of Bill's legacies is that he has left behind a strong and capable wife and son who have guided us with grace and dignity through these last days with Bill. He has also left behind a dedicated and active group of colleagues, which he molded into an internationally respected conservation organization—The Peregrine Fund—and which he wisely left with the capability to move forward without him, but ever in memory of him.



Christina Kleberg

Aplomado Falcon: An Experiment in Species Restoration

Grainger Hunt, Angel Montoya & Paul Juergens **T**he range of the Aplomado Falcon centers in Latin America, but in the 1800s, the species extended over a sizeable portion of the southwestern United States. The historic range included the savannas of coastal southern Texas, western Texas, southern New Mexico, and southeastern Arizona. One can only imagine the corresponding distribution in northern Mexico in those days, but, at present, Aplomados occur primarily from Veracruz southward along Mexico's eastern coast and elsewhere in scattered locations, including the grasslands of eastern Chihuahua. What accounted for the profound shrinkage in the Aplomado's range remains uncertain, but changes in the character of savannas, from open grasslands to brushlands and croplands, was likely the primary factor. By the 1930s, the species had all but disappeared from the United States, with the last known nest near Deming, New Mexico, in 1952.

In the mid-1990s, The Peregrine Fund chose southern Texas as the place to begin the restoration process. There are still remnants of open grasslands, particularly near the coast, and there is abundant food for Aplomados in the form of doves and other medium-sized birds. Today, following the release of some 840 fledgling Aplomados produced at The Peregrine Fund's captive-breeding project in Boise, Idaho, there are at least 50 wild pairs extending from the Brownsville area north to Matagorda Island near Rockport. Wild reproduction has been excellent during the past

several years with the annual fledging of at least 50 young, despite a recent drought. With careful monitoring and management, there is every reason to believe that the population will thrive within the area.

The Peregrine Fund learned much during its work in South Texas. In a way, the releases were experimental, in that so little was known in the beginning about how well the eventual population would fare and what problems it would face. It was quickly learned, for example, that predation by the Great Horned Owl is the critical factor influencing the survival and eventual distribution of the falcons, the owls being far



Schuyler Moore



Schuyler Moore

An adult female Aplomado Falcon delivers food to young chicks. Nests built in yuccas (inset above) and abandoned by other raptors like the White-tail Hawk are preferred nest sites because they provide protection from predators.

more common in brushlands than in open grasslands. Brushlands are also less suitable than open grasslands to the hunting strategies of Aplomados, in that brush affords escape cover to birds being pursued by the falcons. In the larger perspective, The Peregrine Fund's experiment brought logic to the simple explanation that brush encroachment caused the loss of the Aplomado, that loss beginning with the arrival of the Spanish in the 1600s. Today, ranchers throughout the region are actively involved in restoring and managing open grasslands on behalf of cattle production, a factor that bodes well for the future of Aplomados and other open-country species, such as Attwater's Prairie-Chicken.

In 2002, with the restoration process well in hand in coastal Texas, The Peregrine Fund began releasing captive-bred young in the yucca grasslands of West Texas near the town of Valentine. Like the releases in southern Texas, the project is largely experimental. The extensive grasslands appear ideal in many ways, but food supplies may be limiting, particularly in drought years, as has been evident in our studies of breeding Aplomados in nearby Chihuahua, Mexico. Researchers are beginning to see pairs forming in West Texas, and the first wild reproduction seems just around the corner. Meanwhile, The Peregrine Fund is continuing to develop relationships with private landowners in an

effort to increase enrollment in Safe Harbor, a provision of the Endangered Species Act that exempts landowners from federal regulations on land use associated with released populations. Safe Harbor, now covering more than two million acres in Texas, has fostered the good will and cooperation of many ranchers, allowing them to be integrally involved in the success of the project.

The Safe Harbor provision, so successful in Texas, does not apply well in New Mexico because most of the historic range of Aplomados there is federally owned. However, an alternative provision in the Endangered Species Act, known as the 10(j) rule, allows reintroduced populations to be regarded as experimental. Since The Peregrine Fund believes that good will is the most important factor in falcon restoration, the organization was unwilling to release falcons in New Mexico without the 10(j) in effect. When the Aplomado finally received its 10(j) designation in mid-summer 2006, The Peregrine Fund was ready and able to begin falcon restoration in New Mexico by releasing 11 young falcons on the Armendaris Ranch in Sierra County. As in any experiment, only time and close monitoring will tell whether all the necessary habitat ingredients are in place, but, to date, all 11 falcons have survived, an unusually high rate, attributable perhaps to a scarcity of Great Horned Owls in the area of release.

Species restoration requires persistence and sustained financial investment. We thank the many individuals and organizations that have brought this magnificent species back to the American Southwest and two foundations specifically. Our progress in restoring the Northern Aplomado Falcon has only been possible with significant and dedicated funding from the Lee and Ramona Bass Foundation and the Robert J. Kleberg and Helen C. Kleberg Foundation. The Bass family has the distinction of being the project's largest donor while the Kleberg foundation, along with providing considerable support, has been with us since the project began.



Christina Kleberg

Peregrine Fund Biologist Angel Montoya is assisted in placing a young falcon into a protective hackbox at a release site by Jill Miller, one of the many landowners who participate in restoration work through the Safe Harbor program.

Above: A young Aplomado Falcon carries a yucca seed pod during playful activity with other young falcons.

As in any experiment, only time and close monitoring will tell whether all the necessary habitat ingredients are in place.

Wings on the Rising Wind

Grainger Hunt
& Chris Parish

Life for the California Condor, the largest of all North American soaring birds, is all about air currents. When one of these great scavengers launches itself from The Peregrine Fund's release site on the edge of the Vermilion Cliffs, high above the Colorado River in northern Arizona, a strong updraft carries her easily yet another thousand feet above the valley floor. There she joins a buoyant flock of contemporaries soaring upon adventure, this time across the pine forests of the Kaibab Plateau to the promise of deer carrion along its western edge. From there, the condors drift effortlessly southward upon a curving beltway of rising air, as the earth falls away into the enormity of the Grand Canyon, then up again to the peopled summit of its southern rim. Here the arriving condors join ravens and Turkey Vultures, coursing above a throng of park visitors, binoculars in hand, thrilled by the sight of condors at close range. Among the observers is a Peregrine Fund biologist who systematically accounts for each condor according to its radio signal or numbered wing tag. Meanwhile, the great birds, unaware of their notoriety, settle singly or in small groups upon the canyon wall for the night.

The reappearance of condors during the past decade represents a change in their fortune running counter to a century-long trend of decline. By the early 1980s, only 22 individuals remained in existence, all in southern California, their rate of population decrease so steep and their extinction so imminent that all were taken into captivity. Experts at the Los Angeles and San Diego zoos paired them for breeding, and the birds have since produced hundreds of youngsters. Each year since 1996, young condors produced at The Peregrine Fund's captive breeding facility in Boise, Idaho, have been set free in northern Arizona, and there are now almost 60 free-ranging individuals, including at least four wild-breeding pairs.

Condors were absent from Arizona prior to the onset of the reintroduction project. Scattered sightings around the turn of the Twentieth Century may have reflected the existence of a small population, but the last known full-scale habitation of the Grand Canyon region was at the close of the ice age when now-extinct mammoths, camels, and horses were still abundant enough to produce an ample supply of carrion. As these large animals disappeared from the landscape, the condor population receded to its stronghold on California's coast, sustained in part by the beached carcasses of marine mammals. The arrival of Spanish cattle to California in the late 1700s, however, increased condor food supplies inland, and the subsequent spreading of livestock to other parts of the West, together with modern wildlife management programs, enhanced the prospects for condor reestablishment.

Today's northern Arizona is an area where terrain conditions appear perfectly suitable for condors—a wonderland of air currents giving them an easy, energy-saving chance to travel. These currents arise from expanses of bare rock that warm in the sunshine and create air pressure differences across the landscape. Prevailing southwesterly winds deflected upward by the steep slopes and cliff faces form natural elevators for condors to tower upon, then glide to the next updraft. The cliffs also provide lofty perches, not only offering expansive views of the surrounding country to these sharp-eyed scavengers, but also cavities for nesting, safely isolated from predators.

As in many reintroduction projects, the Arizona condor program is immersed in the science of adaptive management, an ongoing process of decision-



making based on results in the field. A decade ago, when The Peregrine Fund began releasing condors in Arizona, no certain knowledge existed about how they would fit into the landscape or what dangers would await them. Long-ranging flights during the first few years took them as far away as Flaming Gorge, Wyoming, but eventually the flock settled on a core area of travel, from the release site at Vermilion Cliffs National Monument, south to the Grand Canyon National Park, and north to the Kolob region of southern Utah. Meanwhile, the periodic return of condors to the release site, especially in winter, made it possible to monitor their health, maintain tracking devices, and recapture those whose behavior did not yet suit them to life in the wild.

As condors became more proficient at finding wild carrion, the incidence of lead poisoning increased. Peregrine Fund biologists responded with the systematic testing and treatment of condors returning to the

Chris Parish



Hatched in 2001, this male condor is now approaching breeding age as evidenced by changes in coloration. Juveniles have mottled gray to white underwing feathers and black heads; adult underwing feathers are pure white, and heads are brilliant pink or orange.

Chris Parish

to a 50 percent reduction in the incidence of lead in deer remains. A questionnaire revealed that few of the hunters had been aware that condors occurred in their hunting area, and fewer still knew of the danger of lead poisoning. Once informed, the majority responded enthusiastically by using lead-free copper bullets during their hunt. Fortunately for condors, ballistics experts consider these "X-bullets," developed by the Barnes Bullet Company in Linden, Utah, to be superior for hunting purposes and, indeed, the Arizona hunters overwhelmingly agreed: 93 percent of respondents said that the non-lead bullets performed as well or better than lead-based bullets. Although copper bullets are more expensive than comparable lead-based bullets, increasing use by conservation-minded hunters bodes well for the future of the condor population.

There is still much work to do in establishing a self-sustaining condor population in the canyon country of northern Arizona and southern Utah. Each morning, as always, radio-trackers station themselves at strategic points and follow the condors as they depart upon the wind. The new day may present the unexpected—perhaps a new pairing or an unanticipated journey—a young bird heading out alone, following a Golden Eagle to hidden food or joining a cadre of ravens clustered in a river nook. The job of these dedicated men and women is to safeguard the birds from harm, to collect scientific data to better understand the population, and to educate the people around them about condors and condor restoration. It is certain that public appreciation for this magnificent species will show its importance over the long term, as exemplified by the robust cooperation of northern Arizona deer hunters and their success in reducing condor exposure to lead. If such forces in conservation are signs of the future, these extraordinary wind-riders will, like Peregrines and Bald Eagles, replenish themselves as celebrated members of the southwestern wildlife community.

A stair-step of cliffs descending to canyon walls along the Colorado River near Navajo Bridge provides optimal roosting, breeding, and foraging habitat for California Condors.

Although copper bullets are more expensive than comparable lead-based bullets, increasing use by conservation-minded hunters bodes well for the future of the condor population.

Eastern Peregrines Revisited

Nearly all of these falcons had disappeared by the 1960s, primarily owing to the effects of DDT on their reproduction.

When The Peregrine Fund began its captive breeding and reintroduction program at Cornell University in 1970, there were no Peregrines known to be nesting in a vast region from the Mississippi River to the Atlantic Coast. Historically there had been about 50 occupied eyries in the Upper Great Lakes region and along the upper Mississippi River and its tributaries, and another 50 or so in southern Ontario, Quebec, and the Maritimes. In the eastern states from Maine to Alabama and Georgia, Joe Hickey, the father of Peregrine biology, had carefully tabulated a list of 205 known and probable eyries, and he estimated that the total population of this Appalachian region was about 350 pairs, overall some 450 pairs. Nearly all of these falcons had disappeared by the 1960s, primarily owing to the effects of DDT on their reproduction.

The banning of DDT in 1972 gave hope that the environment would soon be clean enough to support breeding Peregrines once again. In 1974 The Peregrine Fund released its first captive-produced falcons, in New York State. From that time to the end of the reintroduction program in 1992, we released nearly 1,300 captive-produced falcons in 13 eastern states. Researchers at the Raptor Center, University of Minnesota, and Canadian workers carried out comparable reintroductions in the Midwest and Upper Great Lakes region and in southeastern Canada. These three regions comprise what was the range of the original eastern "duck hawks" or "rock peregrines" as they used to be called.

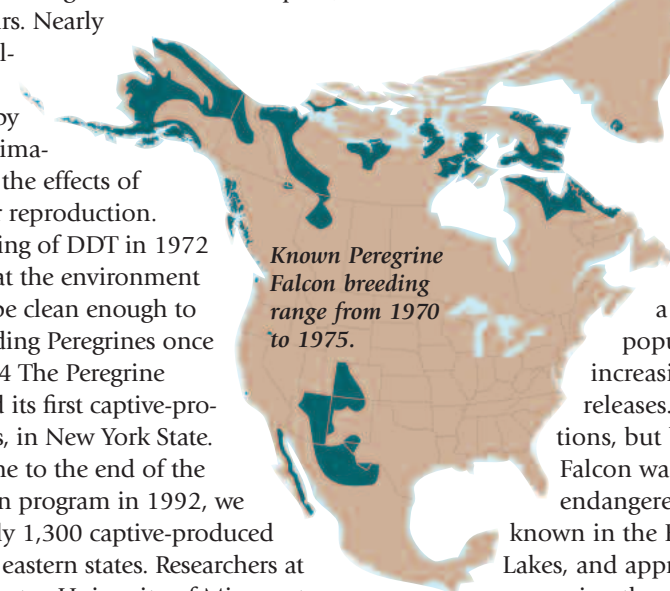
We found the first released falcons breeding successfully in the wild in 1980, one pair on a cliff in southern Quebec near Vermont, and two pairs utilizing hack boxes on towers in the salt marshes of New Jersey. From that time to the end of our fieldwork in the eastern states 12 years later, the population rapidly built up to a minimum of 92 territorial pairs, nesting in a variety of situations, some on cliffs but others on buildings in cities, on bridges, and on hack towers we had constructed in coastal salt marshes for releasing young falcons. Some pairs were also nesting by then in the Midwest and southeastern Canada.

Although the recovery goal in the official U.S. Fish and Wildlife Service's recovery plan for the eastern region was a minimum of 175 breeding pairs, or whatever number the current environment would sup-



Jim Weaver

Phyllis Dague, one of the first hired for the breeding program at Cornell, reads a poster developed to enhance reports of Peregrine sightings.



Known Peregrine Falcon breeding range from 1970 to 1975.

port, we felt that by 1992 there were enough established pairs breeding at a sufficiently successful rate so that the population would be able to continue increasing on its own without additional releases. Some of our associates had reservations, but by 1999, when the American Peregrine Falcon was finally removed from the list of endangered species, there were about 118 pairs known in the East, 107 in the Midwest and Great Lakes, and approximately 65 in southeastern Canada, surpassing the minimum recovery goal for the United States by some 50 pairs.

This is not the end of the story, however, for these populations have continued to increase toward that ultimate number that the current environment can support. I recently conducted an informal survey of eastern states and provinces and found that in 2005 a minimum of 230 active nesting sites were known in the East, 158 in the Midwest, and 137 in southeastern Canada, some 525 pairs now exceeding the total number estimated to have occurred in the region in the 1930s and 40s prior to the widespread use of DDT and nearly doubling in size in the six years since the falcons were de-listed in 1999.

The falcons in New York and New Jersey have shown especially impressive population growth. New York had 62 pairs last year, New Jersey had 20, many more than were known in earlier decades. New York City alone has a dozen or more pairs nesting on buildings and bridges, but most gratifying of all, the famous Hudson River Palisades in New Jersey, directly across the river from New York City, again harbor four to five

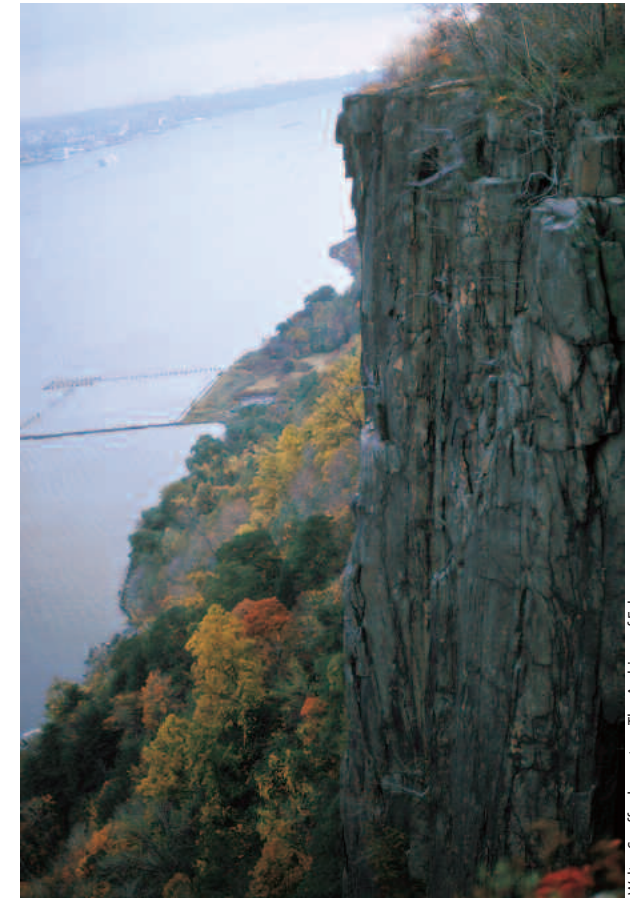
nesting pairs. These eyries were probably the ones naturalists and falconers visited most frequently in the early 1900s, including such well-known Peregrine enthusiasts as Roger Tory Peterson, Dick Herbert, Joe Hickey, and Walter R. Spofford.

Their successful re-occupancy after 50 years of abandonment represents a high point in the long road to full recovery of Peregrines in North America, as do the re-occupied eyries on cliffs of the upper Mississippi and the north shore of Lake Superior. One reason is because Great Horned Owls had taken over many of the old river bank areas where the falcons used to nest, and it took some time for the newly established falcons to learn how to deal with the owls.

In the first week of June, 2006, my wife and I had the great fortune to visit some of the old, and new, Hudson River eyries with state and local coworkers with whom we had shared both good and bad times in the early years of the restoration effort. Kathy Clark of the New Jersey endangered species program and Linn Pierson with the Palisades Interstate Park kindly showed us the eyries on the Hudson Palisades, and most exciting, we may have discovered a new, fifth nesting pair. Next, we spent a day with Chris Nadeski of the New York City Department of Environmental Protection, keeper of the city's Peregrines, and Dr. Heinz Meng, Professor Emeritus of the State University of New York at New Paltz, who helped with the first hacking of young Peregrines in 1974 and 1975. We were hoping to view two re-established pairs at the historical Traps and Millbrook eyries in the Shawangunk Mountains within the private Mohonk Preserve. Because of rain we settled for a slide show, which Chris presented at the Mohonk Preserve's new interpretive center. The following morning we ended up meeting Barb Loucks and Pete Nye, both with the New York State Department of Environmental Conservation, underneath a bridge between Albany and Rensselaer, where a pair of Peregrines had three nearly fledged young in a nest box on a tier below the roadbed of the bridge.

These bridge sites have become frequent places for Peregrines to nest, and just about every bridge across the Hudson from the Verrazano Narrows to Albany has a nesting pair. Acceptance of such a wide array of nesting sites is one reason why Peregrines are now more abundant in many parts of their range than they used to be.

It was spiritually restoring to see these eyries flourishing after so many years when no Peregrines nested in eastern North America. Peregrine eyries are very special places for those who are captivated by falcons. They become etched into our memories like engravings on the finest Damascus steel. They epitomize the words of John Keats: "A thing of beauty is a joy forever..."



Alpine Lookout, one of the eyries on the lower Hudson River that is now reoccupied after a lapse of nearly 50 years.

Walter Spofford, courtesy The Archives of Falconry



File photo

One of the early captive-breeding Peregrines at Cornell feeds its young.

Tom Cade

Jim Weaver and Steve Sherrod in 1975 at the Taughannock Falls hack site, where the hack box was built into the cliff. Young falcons are being lowered in a box.

Conservation Medal Awarded to Peregrine Fund Visionaries

The Zoological Society of San Diego will award its prestigious Conservation Medal this year to three men whose vision and energy has steered The Peregrine Fund and helped to conserve raptors around the globe.

Bill Burnham, Tom Cade, and Paxson Offield will be honored December 7 at the Zoological Society's President's Club Holiday Dinner.

The Conservation Medal is awarded annually by the Zoological Society's Board of Trustees to individuals who have significantly increased knowledge of wildlife habitats; played an active role in endangered species preservation through breeding programs, research and the establishment of wildlife preserves; or furthered the cause of conservation through financial support, influence or publicity. Since its inception in 1966, the Conservation Medal has been presented to an impressive international array of more than 50 conservationists. Past recipients include Jane Goodall, Gilbert M. Grosvenor, H.R.H. The Duke of Edinburgh, Sir David Attenborough, and E.O. Wilson.

Tom Cade, Founding Chairman and Director of The Peregrine Fund, was one of a group of scientists and falconers searching for the cause of catastrophic declines of Peregrine Falcon populations in the late 1960s. This group found a link between exposure to DDT, a common pesticide, and the thickness and viability of Peregrines' eggshells. As a professor at Cornell University in New York, Cade founded The Peregrine Fund to develop techniques for captive breeding and release, and to educate the public about the plight of birds of prey. Using a unique combination of falconry and scientific methods, Cade and his associates released nearly 1,300 captive-produced falcons in 13 Eastern states.

Bill Burnham joined The Peregrine Fund in 1974 to develop and manage its Western program for Peregrine restoration. Three years later, his work earned him a place on the board of directors, and in 1984 he was appointed to lead the entire organization, a role he fulfilled for 23 years. His vision and commitment helped to establish the World Center for Birds of Prey in Boise, Idaho, and propelled the organization beyond Peregrine recovery to now encompass raptor species worldwide.

Paxson Offield, in addition to serving as The Peregrine Fund's Chairman of the Board from 2002 to 2005, has also provided significant financial support for the Fund's work to conserve Gyrfalcons and Harpy Eagles. He is also a long time supporter of the conservation work of the Zoological Society of San Diego through the Offield Family Foundation. He has supported numerous grants for conservation scientists at the Zoological Society's center for Conservation and Research for Endangered Species (CRES).

The not-for-profit Zoological Society of San Diego manages the 100-acre San Diego Zoo, the 1,800-acre San Diego Zoo's Wild Animal Park (more than half of which has been set aside as protected native species habitat), and CRES.



Jack Caiffery



Kurt K. Burnham



courtesy of Paxson Offield

Conservation Medal recipients (from top) Tom Cade, Bill Burnham, and Paxson Offield.

Orange-breasted Falcon Captive Propagation Succeeds—at Last



Adult male (left) and female Orange-breasted Falcons. Males of this species are about 40 percent smaller than females, which typically weigh about 600 grams (21 ounces).

Robert B. Berry

My fascination with the Orange-breasted Falcon (OBF) began in 1992. Bill Burnham and I were sprawled on a large boulder on the bank of the Macal River in western Belize glassing an intimidating cliff face called Ecktun (Black Rock) that was home to a pair of OBFs. My scribbled notes bear witness to my excitement as the male, buoyed by afternoon thermals, mounted to incredible heights without ever beating his wings, only to plummet vertically with astonishing speed, streaking past his cliff face, then pitch up for a repeat performance or roll and bank like a jet fighter and rocket away to harass a Black Vulture or Plumbeous Kite. Little did we know that in a large deep cavity in the cliff there was a female OBF brooding three youngsters that were later observed to fledge successfully. Throughout the following week, we were to see several other active OBF eyries and an extraordinary number of tropical birds. I was hooked for life!

Biology, Early Research, and Distribution

The OBF is a brilliantly-colored, medium-sized falcon that inhabits the moist tropical forests of Central and South America. Unlike several species of forest falcons, the OBF's niche is above the forest canopy, nesting on ledges and potholes of large cliffs and sometimes

among epiphytes in emergent trees. It feeds on a large variety of small- to medium-size birds and bats captured in flight, most often during hunts at dawn and dusk. Before Peter Jenny began his research and studies on the species in 1978, little was known about the species' biology, and its distribution and population continue to be poorly understood. The species' distribution is defined by sightings and fewer than 50 specimens in the world's museums. After several decades of research, including aerial and ground surveys throughout much of Central America, The Peregrine Fund is beginning to understand the natural history of the species, and the breadth of its vast but patchy distribution, which may have extended from southeast Mexico through Central America south to Peru, Bolivia, Paraguay, and northern Argentina.

The largest known and only extensively studied OBF population resides in the rolling forested limestone hills of Belize and Guatemala. We have identified 19 nesting territories and estimate this most northern population at fewer than 50 pairs. One has to travel 900 miles to the south to find the next OBF eyrie in the Darien Province of Panama, the northern limit of the southern population. Records from the last century suggest that these populations were once contiguous. Much less is

After 14 years of working with OBFs, 2006 proved to be the breakthrough year for successful propagation.

(continued on page 12)



Robert B. Berry

Orange-breasted Falcon (continued from page 11) known about the South American population other than sight records, which are often confused with the similar but more common Bat Falcon, and a few museum specimens. The species appears to be sensitive to deforestation and other types of habitat alteration, but its wide distribution may buffer its risk of extinction.

Research, Collecting for Propagation, and Failures

Because of the OBF's extreme rarity and preference for remote primary rainforest, the study and preservation of the species has been one of The Peregrine Fund's greatest challenges. Peter and Barbara Jenny collected the first pair for captive propagation from Guatemala in 1980, which produced two youngsters via artificial insemination at Cornell in 1985. Both the adults and their progeny failed to reproduce thereafter. Three more OBFs were collected in Guatemala in 1983 and were housed with the Santa Cruz Predatory Bird Research Group in California, only to die within a year of unknown causes.

In 1991, Aaron Baker began his landmark six-year study of the OBF in Belize and Guatemala as a member of The Peregrine Fund's Maya Project. Aaron's master's thesis and scientific publications have provided much of what we know today about the natural history of the species.

With Aaron's help, I was able to collect six OBF chicks in 1993 and 1994 that were housed at my facility in Wyoming. I also imported a female OBF rescued from a bird market in Peru. One of these three pairs was to lay infertile eggs at both three and four years of age. Our hopes for successful propagation were dashed in 1997 when six of the seven OBFs died in less than 12 hours from an adenovirus infection, possibly the same virus that killed the birds at Santa Cruz in 1983. Our initial propagation efforts had failed, and we were only beginning to understand the husbandry of the species in captivity. Before any future collections could be undertaken, we had to find out where the virus came from and how to prevent a future attack. Our fears were to be mitigated by the series of events that followed.

A New Beginning—the Neotropical Raptor Center

Shortly after the conclusion of the 10-year Maya Project, Wendy Paulson and I urged Bill Burnham to consider establishing a permanent research station in Latin America. This conversation led to the founding of the Neotropical Raptor Center in Panama in 1999. The center was created as a raptor research facility that included captive propagation and release of Harpy Eagles and possibly other species of concern. No OBF nesting had been recorded in Panama, although two museum specimens had been collected. Sight records of the species were sketchy. Even Robert Ridgely, author of *A Guide to the Birds of Panama*, had not positively identified the species in Panama and has observed fewer than a dozen individuals elsewhere during his lifetime of work in the Tropics. We were delighted when a subsequent helicopter survey of Harpy Eagle nests disclosed

four nesting pairs of OBFs in Darien Province close to the Colombian border. During this same period, avian virologist Lindsay Oaks had been studying adenovirus in falcons from a 1996 outbreak infecting the Aplomado Falcon and had identified the Peregrine as the endemic carrier of the disease. Knowing the source of the disease was wonderful news since it would give us the knowledge to protect other species. Talk of OBF collections for captive propagation surfaced once again.

In 2000 I constructed a new falcon breeding barn in Wyoming to more closely mimic the habitat requirements of tropical species. No Peregrine had ever been housed in the new facility. Beginning in 2001 through 2005, Angel Muela and other biologists collected 16 OBFs, 14 from Panama and two from Belize, all but three being collected as eggs which permitted the parents to recycle and lay more eggs to sustain productivity. These eggs were hatched successfully at the Neotropical Raptor Center and two, both males, were experimentally released for the first time in 2005. During this period, I recognized possible deficiencies in my new facilities and began constructing a third generation building for OBFs.

In 2005, three female OBFs laid 15 infertile eggs. Subsequently, foster chicks were placed with each female to promote future breeding success. One of the females in Panama also laid a single egg but did not incubate. Encouraged by the Wyoming success, we decided that our options for successful propagation would be maximized by combining all of our OBFs in a single facility in Wyoming and that the risks of doing so were manageable. On 8 January 2006, all eight falcons from the Panama facility were transported by private charter aircraft directly to my facility, courtesy of Peregrine Fund Chairman Emeritus, Paxson Offield.

Success at Last

After 14 years of working with OBFs, 2006 proved to be the breakthrough year for successful propagation. Close observations again confirmed aberrant courtship without copulation prior to egg laying. As a result, artificial insemination was initiated after the first egg was laid in each of five clutches. Four healthy youngsters were produced from 16 eggs bringing the total number of the captive colony to 20.

Management and Goals

The art of falconry has provided many of the tools for species management and restoration used by The Peregrine Fund. Two OBFs reared together are being carefully exercised in traditional falconry so that we may learn more about their management and behavior and how they have evolved relative to temperate zone raptors. They have already provided some significant clues. Their minimal play and silent demeanor compared to other falcon species suggest that the benefits from these behaviors are overridden by some factor, such as increased mortality from predation in the Tropics. Also, their delayed first attempts to attack live quarry are consistent with a slower rate of maturity and



Ryan Phillips

A wild OBF in Belize, "one of the truly exquisite gems of the rainforest."

a longer period of parental dependency observed in other tropical species. Although observation in a natural situation is needed to test these hypotheses, we have already learned that the period of care and feeding during release of captive-bred birds may have to be extended for the OBF. We are just beginning to uncover the secrets of this enigmatic species. Bill Burnham has written: "Through captive management and breeding, we will learn about species behavior and reproductive biology. Through captive propagation and release, we will increase our knowledge, particularly if a population could be established in a workable terrain and situation."

We expect to take a giant step forward next spring with the experimental release of captive-bred OBFs in the Maya Mountains of Belize. If all goes well, we will begin to establish a self-sustaining, experimental population and long-term study of the species the following year at a location to be determined. Our ultimate goal is to discover those factors that limit OBF populations and how we might address those factors for the benefit of the species.

We expect to take a giant step forward next spring with the experimental release of captive-bred OBFs in the Maya Mountains of Belize.



Robert B. Berry



Robert B. Berry

Above: Bob Berry feeds a male Orange-breasted Falcon (OBF) following free-flying behavioral studies. OBFs are crepuscular, or most active at twilight.

Center: A 25-day-old OBF chick (left) feeds from a bowl with a 13-day-old male.

Below: Third generation OBF breeding facilities near Sheridan, Wyoming, with four additional chambers under construction in the foreground.

New Chapter Begins for Neotropical Raptor Conservation



The Rio Bravo Conservation Management Area in Belize is part of the larger Selva Maya, one of the largest remaining tracts of contiguous forest in Central America. Here, there is still an abundance of prey and habitat able to sustain the needs of a large predator such as the Harpy Eagle.



Searching for released Harpy Eagles is slow, difficult work; field biologist Ryan Phillips negotiates a swamp in Belize.

Marta Curti, Angel Muela, & Saskia Santamaria

The Harpy Eagle is the largest eagle in the Americas. A charismatic species that instills wonder and admiration in all who see it, the national bird of Panama is an ideal symbol for the conservation of large predators worldwide. Though it maintains a relative, but dwindling, stronghold in much of South America, its numbers in most of Central America have plummeted. These are some of the reasons we chose the Harpy Eagle as the focus of our conservation efforts in Panama.

When the Harpy Eagle Conservation Program first began, the goal was three-fold: first, to successfully and predictably breed, hatch, and raise young Harpy Eagles in captivity; second, to develop techniques to release young Harpy Eagles into the wild in such a way as to maximize their chances of survival to independence and eventual breeding; and finally, to adapt both the captive breeding and release methods to other large forest eagles that are much less known and potentially more endangered than the Harpy Eagle.

With the successful release of over 30 captive-bred birds and three wild-hatched rehabilitated birds, the first two goals of this project have been met. Now we begin our focus on the third goal—turning our attention to other tropical raptors that are less known and could be much closer to the brink of extinction than the Harpy Eagle.

Since 1998, we have been releasing captive-bred Harpy Eagles into the forests of Panama and Belize. Over the years, as we learned more about the behavior and specific needs of this large forest eagle, we have adapted and modified our management techniques in order to have the highest possible success rate.

We began the captive breeding of Harpy Eagles at our facility in Boise, Idaho, in 1995, and through 2001, a total of 10 chicks hatched from three breeding pairs. Despite efforts to create special environmentally controlled breeding chambers that closely mimicked their natural habitat, the chicks were not hatching or not surviving for long after hatching. It became evident that a naturally warm, moist, and sunlit environment was necessary for them to breed successfully. In 2001, the breeding pairs were moved to a new facility located just outside of Panama City, Panama, and built specifically to meet the Harpy Eagles' needs. In the first breeding season alone, the three pairs produced 17 healthy chicks and have continued to produce five to seven chicks each year.

Likewise, our releases have gone exceptionally well and we have had a 60 percent survival rate among released birds. This is quite high compared to the approximate 25 percent survival rate of most wild young. Over time we have also adapted our release techniques to the special needs of Harpy Eagles. Initially, we released the birds at six months old, their normal fledging age in the wild. However, these birds took many

months, sometimes more than a year, to become fully independent and begin hunting on their own. Yet, one female that was released at 20 months of age, began hunting significantly earlier after release than most of the other birds. To test the theory that Harpy Eagles could become independent more rapidly if they were released at an older age, we began releasing birds at 18 months of age and early results suggest this method may work to reduce the amount of time young birds are dependent on human care in the wild. These types of adaptations and lessons learned will help make the release of Harpy Eagles and other large forest eagles possible and practical in the future.

Over the coming year we will release six more juvenile Harpy Eagles into Soberania National Park in Panama. Once the young birds are independent, they will be translocated and released again in the forests of Rio Bravo, Belize, their final home. We will also test the release of two adult breeding pairs to learn more about their behavior. Our hope is that they will stay together as bonded pairs and quickly begin to nest in the wild near their release site, thus avoiding the lengthy period of juvenile dispersal—a time when natural mortality in the wild is very high. Volunteers will remain in Soberania National Park and will continue to monitor the success of the released birds, feeding them as necessary, and tracking them to ensure that they are hunting on their own. Once the last of the young birds reaches independence, close field management will most likely not be needed. The adult pairs and all independent birds will be fitted with special transmitters that allow us to continue monitoring their movements deep into the forest via satellite. By tracking the birds in this way, we can detect changes in their behavior, measure dispersal and home range, and identify when they begin breeding for the first time.

Over the next year we will also continue our on-the-ground study of released, independent eagles in Belize. Two biologists are tracking each of our eagles for one month during the rainy season and one month during the dry season. They are studying dispersal patterns and distances, prey availability and selection, and development of foraging behavior. These studies will help us to learn more about the habitat, food, and space needs of this species over time.

By closing one door to the Harpy Eagle captive-breeding and release project, we will be able to open many others and devote more time and resources to learning about numerous species of little-known raptors throughout Latin America. We will be able to study these species, many of which are of unknown conservation status, and have the opportunity and knowledge to develop the best course of action to prevent their extinction. Our approach may include another captive-breeding and release program with lessons learned from the Harpy Eagle project enabling greater likelihood of success.



This female Harpy Eagle was the first hatched at the then newly-created Neotropical Raptor Center in Panama. She was released in Soberania National Park in September 2002. Once independent, she was relocated to the Rio Bravo Conservation Management Area in Belize, where she continues to thrive.

... we begin our focus on the third goal—turning our attention to other tropical raptors that are less known and could be much closer to the brink of extinction than the Harpy Eagle.

Once Upon a Vulture

Munir Virani “Disgusting birds with bald scarlet heads, formed to revel in putridity,” pronounced an appalled Charles Darwin when he first saw Turkey Vultures on his famous voyage to South America in the H.M.S. Beagle in 1832. It’s a view of vultures and their “grotesque” habits that continues to this day. The poet Amy Lowell wrote, “hate is ravening vulture beaks descending on a place of skulls.” Vultures do not evoke a particularly inspiring image. We are all too familiar with a venue of vultures jostling with their blood-stained heads at a carcass amidst a cacophony of sordid hissing. No wonder they are viewed as famished villains and opportunistic hoodlums waiting for their chance to cash in at a kill.

Despite this popular view, there are now those of us—with insight gained from studying these birds—who regard vultures as among the most graceful and spectacular of all flying animals. With a great mastery of flight, these denizens of the skies soar effortlessly, riding natural air currents to carry them afar in search of their food. Darwin later wrote of them, “it is truly wonderful and beautiful to see so great a bird, hour upon hour, without any apparent exertion, wheeling and gliding upon mountain and river.” If the great Charles Darwin changed his opinion about vultures, then this is my attempt to change yours!

During my involvement with the Asian Vulture Crisis Project, I have met hundreds of people who ask me the obligatory, “So what do you do?” question. “Well, I work with a team of people trying to save vultures of the genus *Gyps* in South Asia from extinction,” is my answer. “They are dying of kidney failure from eating dead livestock contaminated with a painkilling drug called diclofenac. Nearly 99 percent of three species of *Gyps* vulture populations have perished as a result.” The reactions I get range from astonishment to fascination. As of June I can now add, “The government of India has recently placed a ban on the manufacture of veterinary diclofenac, so there is hope that vulture populations will recover, though we think they will need help through captive breeding.” Given half a chance, I’ll launch into an impassioned lecture about why South Asian *Gyps* vultures are unique and valuable, and why we have an obligation to save these magnificent birds of prey from extinction.

Vultures are highly evolved raptors. Fossil records from about 40 million years ago show that their ancestors had large talons typically associated with birds of prey. As the earth cooled, grasslands expanded and grazing mammals became larger, more numerous, and more available in the open landscape, creating a new food niche for large, flying scavengers. Over thousands of years of adaptation, vultures’ talons reduced in size, and they lost the agility, aggression, and killer instincts that characterize most other birds of prey. Instead, vultures became extremely efficient at locating carrion by mastering their foremost asset—the art of soaring to great heights. Notwithstanding human pressures of persecution, habitat loss, and poisoning, vultures became arguably among the most successful of all raptors.

Vultures may look hideous by human standards, but they are marvels of evolutionary engineering. Their unparalleled ability to soar, gliding through the air for long periods of time without losing altitude, comes from having a large wing area in relation to body size. Combined with a skillful understanding of their environment to detect rising air currents, this makes them



An official of the village of Nimli, in the state of Rajasthan, India, explains a Peregrine Fund flyer about the dangers of diclofenac.

appears to have led to an increase in feral dog and rat populations, necessitating alternative methods of carcass disposal to reduce public health risks from plague, rabies, and physical attack. Loss of vultures, therefore, represents not only a loss of biodiversity, but also loss of important ecological, economic, human health, and cultural resources.

proficient at effortlessly traveling long distances in search of food. Vultures need to be heavy and large to soar at great speeds, and they need to quickly eat huge amounts (up to 20 percent of body weight) to take back to their chicks. Being heavy and large helps them defend themselves—and their food—against jackals, coyotes, and hyenas at a carcass, and it allows them to store fat and go long periods between meals. Bare skin on their heads and necks helps them keep clean despite sticking their heads into rotting carcasses. Just as importantly, this bare area helps them radiate heat in hot conditions, thus avoiding heat stress. They have long necks for reaching far into carcasses, and they

In May 2006, the government of India directed all drug companies to stop the manufacture of diclofenac for veterinary use within three months. At least 25 manufacturers have rescinded their licenses. This is an historic triumph in The Peregrine Fund’s and its partners’ vulture conservation efforts. Another drug, meloxicam, has been identified as a suitable and safe alternative. However, it is more expensive to manufacture and will require government subsidies to motivate production and marketing. In the near future, all South Asian countries must also consider existing stocks of veterinary diclofenac and ensure that untested drugs do not replace it.

Effective 21 September 2006, Pakistan banned the veterinary use of diclofenac! Along with its ban in India and Nepal earlier this year, the future of vultures in South Asia is looking significantly brighter. This is terrific news and a moment for The Peregrine Fund to be very proud of its pivotal role in discovering the cause of the Asian vulture crisis.

So why should we care about vultures, particularly in South Asia? Vultures have significant cultural and ecological value that is being lost as their populations plummet. In Hindu mythology, Jatayu, the Vulture King, is believed to have sacrificed his life to save the Goddess Sita. In other cultures, vultures are viewed as “transporters of souls,” releasing cleansed spirits into the universe. Tibetans and the Parsi communities of India still perform sky burials, which rely on vultures to consume the bodies of their dead. As vultures have disappeared, these millennia-old traditions are threatened.

Vultures are nature’s sanitary engineers. They rapidly dispose of infected and rotting carcasses that may otherwise be a reservoir for diseases like anthrax and brucellosis, which can affect both humans and livestock. Their virtual disappearance from most of India and Pakistan

The ramifications of the diclofenac ban on remnant populations of wild vultures will be significant. Hopefully, vultures will begin to return to areas where they had been extirpated. Awareness about diclofenac at the grass roots level is vital in educating rural livestock owners about sensible use of veterinary drugs. Thousands of posters that we have distributed in India and Pakistan will help ensure that diclofenac is not used on livestock. It will take time before the giants of the skies return, as vultures are

slow to reproduce in the wild and will have to compete for food with an established and aggressive feral dog population.

It was not long ago that people perceived sharks and wolves with horror and abhorrence. We have begun to appreciate these animals after discovering that they possess unique behavioral qualities and play important roles in healthy ecosystem function. Vultures deserve not only the same appreciation, but also gratitude for their ecological services, sympathy for the losses caused by diclofenac, and above all, our unstinting support to help their populations recover.

With a great mastery of flight, these denizens of the skies soar effortlessly, riding natural air currents to carry them afar in search of their food.



Munir Virani

Crowned Eagle Conservation in Kenya

Raptor conservation in Kenya faces some unusual competition. Distracted by large, charismatic species such as elephants and lions, conservation entities focus resources on strategies that confine and protect wildlife on the ground, not high in the skies. Historically, awareness created by releases of large cats and elephants has helped create and maintain conservation areas and put Kenya on the map as a premier wildlife viewing destination. The Crowned Eagle certainly deserves the same attention as other powerful predators; it has the physical presence that can attract that all-important tourist-filled minibus, the only salvation for wildlife.

Like other large tropical forest eagles, Crowned Eagles thrive in mature indigenous forests where a high density prey base exists. However, even where habitat and prey remain intact, Crowned Eagles are quickly lost if people persecute them. Such is the case in much of Africa, where their prey is hunted for the “bush meat” trade, and eagles are shot for livestock protection and superstitious beliefs involving eagle body parts and feathers. Add to this the rapid loss of habitat, and these top-of-the-food chain predators are predicted to have a poor future.

For many years, I accompanied the late Leslie Brown in Kenya and Susanne Shultz in Ivory Coast to famous Crowned Eagle nest sites. We found that southern African Crowned Eagles have adapted to even a suburban existence, while others live in exceptionally dry and open locations where a high level of human tolerance to both eagles and their prey is unequalled. Forest cover has dwindled so that of the 27 nest sites I knew in the late 1970s, none survived in 1991. The true number of remaining Crowned Eagles in Kenya is possibly in the low hundreds and declining fast.

Outside my kitchen window is a shed larger than my house in which a pair of Crowned Eagles, Rosy and Girl, are busy nest-building. Rosy is a locally famous male eagle I received in 1978 with a badly fractured wing. His mate, Girl, is of similar age, but was received

in 1987. When I joined The Peregrine Fund in 1991, I built a large breeding chamber on David Hopcraft’s game ranch. Since then, this pair made 12 breeding attempts and successfully raised nine young. It happened to be the first successful captive breeding of this species in the world, and they are still the only captive pair of eagles in Africa that reproduce. They incubate and rear chicks without human intervention, which I believe may have contributed to the overall success of the young when released.

Their breeding is similar to that of other large forest eagles, with one chick produced only every second year, though in some years we were able to induce one chick a year. Each was kept with its parents up to four months post-fledging. Thereafter, parent attentiveness declined and the chicks’ boisterous behavior outgrew the confines of the breeding chamber. They were then removed and flown for falconry in the company of other mature Crowned Eagles until a minimum of three years old. During this time they hunted wild antelope, hares, springhares, and monkeys, and were exposed to potential predators or human threats in preparation for life in the wild. They were asked only to tolerate their handler, and readily avoided the threats.

Sites for release had to fit nearly impossible criteria: healthy, undisturbed indigenous forest; a secure future; and separation from the territories of competing Crowned Eagles. We had the backing of our associates, the Ornithology Department of the National Museums of Kenya and the Kenya Wildlife Service.

We began our releases at Mazima Springs, Tsavo West, in April 1998, but due to its attraction to tourists and the resultant artificially augmented population of Yellow Baboons, we changed our site to another hippo-filled spring at Finch Hattons, a resort in Tsavo West. Over the next seven years we released six Crowned Eagles at Finch Hattons. We owe our success to the park wardens and the hospitality of the lodge owners, Peter and Connie Frank, who provided a number of lucky volunteers and myself with some of the finest accommodation and food to be found in the country! They and virtually all the lodge staff, especially pastry cook Sammy Mwangi, took it upon themselves to help release a succession of eagles into the wild. Of these, two met violent ends in separate attacks by a leopard



and a crocodile. Tragically, we learned nothing from these deaths, nor did we find a solution to avoid such losses. But some eagles did persevere and we were able to follow their progress and ensuing love lives with the same fervour as watching a soap opera.

In 1998, one of the released males moved 15 km (9.3 mi) downstream to a patch of inhospitable Doum Palm forest where I had earlier been treed by a buffalo. From time to time I would see him displaying there in vain attempts to lure a mate. I had searched this forbidding place unarmed, alone, and on foot, and finally had to give up. Then, in May 2003 we saw a freshly fledged female Crowned Eagle emerge from the area. It was impossible that this chick was anything other than his progeny. I was reassured when in 2004 I found him again, with a wild female on a nest. But in February 2006 a pair of African Hawk Eagles occupied the nest, and the Crowned Eagles were absent.

Meanwhile, the pair at Finch Hattons built a series of nests and laid eggs each year from 2004 to 2006. Baboons predated all three chicks within weeks of hatching. Baboons now present a serious threat to the survival of many tree-nesting raptors, even deep within a national park, because they have proliferated from the absence of predators promoted by the proximity of humans and invading livestock. But each year the eagles seek better, less accessible trees and appear ready to successfully raise a chick to fledging soon.

In mid-2005 we released three eagles together at a remote mountain in northern Kenya called Kitich. Again we were fortunate to have the active help of camp owners. Guilio and Andriola Bertoli were besotted by the magnificence of these eagles. Lpiikin Lekeetei, their chief tracker, proved invaluable help in the field. But these eagles were to face an unexpected challenge—a wild pair of Crowned Eagles occupied the higher slopes, and vicious battles ensued. The released eagles found areas of least resistance in which to hide, but we had to remove one for its own safety, and re-release it in Tsavo.

We learned many things from these experiences, not least of which is the need for observation for years after release. Large forest eagles, while they may appear capable of survival where lesser raptors would not, are vulnerable because they depend on acquired skills honed over years of experience. We observed half a dozen young eagles repeat the same clumsy mistakes at perch-



ing, crash landing, and fumbling hunts before establishing themselves successfully in the wild. After a few successful repeats they could fly “blindfolded” through minute gaps between branches and trees as if following a mental map. Interestingly, the same flight paths and perching places were used by different eagles years apart. Their hunting skills, although well proven prior to release, needed a new repertoire of cunning strategies in forest habitat where stealth is of the essence. We observed them attack full-grown female bushbuck and impala (36-54 kg, or 79-119 lb) and very nearly kill them. The female eagles would fly into a galloping herd of impala and take down large calves weighing at least 16 kg (35 lb). Pairs hunting cooperatively have a very high success rate, taking monkeys, hyrax, and antelope calves.

It was nearly 30 years ago when as a boy I flew Rosy in a forest that has long since gone. Crowned Eagles, like all large eagles, were not uncommon. We have shared many adventures and many people have had the responsibility of looking after and releasing his young. He has appeared in the media and a number of documentaries. The simile with the “big five” has certainly helped his and our cause. I look at him and his mate today, identical, un-aged, and perfect in feather, and wonder how much longer they will directly influence Kenyan raptor conservation and awareness.

A male Crowned Eagle released at Kitich in northern Kenya. A local Samburu tribesman (opposite page) helped with the release.

Above, left: an example of forest fragmentation in Kenya.

...it has the physical presence that can attract that all-important tourist-filled minibus, the only salvation for wildlife.



BIRD'S-EYE VIEW

The new Arab Falconry Heritage Wing at **The Archives of Falconry (TAF)** in Boise, Idaho, is nearing completion; Archivist Kent Carnie is working with a team of professionals on the details of displays to complement the centerpiece: a Bedu falconry tent (artist's rendering below), complete with oriental carpets, cushions, and accoutrements. The tent was a gift from His Excellency, Mohamed Al Bowardi, the Managing Director of Abu Dhabi's Environment Agency, to veterinarian Ken Riddle. Ken then donated the tent to The Archives. In 2005, His Highness, Sheikh Mohamed bin Zayed awarded a grant in honor of his late father to help support construction of the new wing.

The Idaho state quarter design, featuring a Peregrine Falcon, was unveiled Monday, 24 July 2006 by Idaho Governor Jim Risch at The Peregrine Fund's World Center for Birds of Prey in Boise, Idaho. The design was chosen by Dirk Kempthorne, Idaho's governor from 1999 until his appointment as U.S. Secretary of the Interior in May 2006. A group of students participating in a summer education program joined Governor Risch (above) and The Peregrine Fund's Raptor Specialist, Trish Nixon, for the announcement. Distribution of the new quarter will begin in 2007. The Peregrine Falcon was designated as the Idaho State Raptor in 2004.



Jack Cafferty

The Second Neotropical Raptor Conference (II NRC) organized by the Neotropical Raptor Network (a Peregrine Fund project) and held in Iguazu National Park, Argentina in June 2006, attracted over 120 participants from South and Central America. Delegates gave over 100 presentations, and participated in five workshops: Management and Handling of Raptors, Falconry Legislation in South America, Conservation of the Andean Condor, Raptor Vocalization Recording and Analysis Techniques, and Raptor Census Techniques. As a result, the Neotropical Raptor Network membership climbed to over 200 this year. For information on membership and a downloadable copy of conference abstracts, visit the Neotropical Raptor Network website: <http://www.neotropicalraptors.org/index.i.html>

Cape Vulture conservation took an important step forward in March 2006 when Peregrine Fund biologist Rick Watson chaired a workshop in South Africa that was convened by the Centre for African Conservation Ecology, Nelson Mandela Metropolitan University, and the Northern Cape Provincial Government in association with the Vulture Study Group, Endangered Wildlife Trust. The meeting was attended by 20 experts in vulture biology from across the species' range from Namibia, Botswana, Zimbabwe, and South Africa. The result was the publication of a Cape Vulture Conservation Plan, and the creation of a locally organized and funded Cape Vulture Conservation Task Force to implement the plan.

"Defying Nature's End: The African Context," a symposium organized by Conservation International, was held in Madagascar in June 2006. Participants from 40 countries examined the critical linkages between biodiversity, ecosystems, poverty, and sustainable development. Ten critical points were identified and entitled the Madagascar Declaration. Among its goals are to conserve biodiversity, protect and restore fresh water systems and coastal ecosystems, support community management of resources, involve the private sector, address agricultural intensification and fuel wood alternatives, and increase collaboration among leaders in Africa and other tropical nations.

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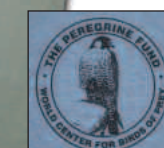
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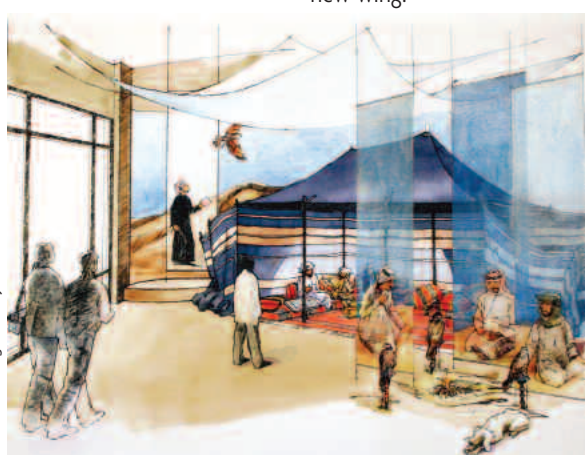
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artist's rendering courtesy of AldrichPears





A Peregrine Falcon descends from its eyrie in Greenland.

Jack Stephens



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