THE PEREGRINE FUND

WORLD CENTER FOR BIRDS OF PREY

2004 ANNUAL REPORT

Working to Conserve Birds of Prey in Nature

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The organization's business-related activities are supported by Pat Burnham (Administrator), Sherry Johnson and Donna Daniels (Bookkeepers), and Sherri Haley (Secretary/Receptionist). Linda Behrman is our Membership Director and manages our web site. Joell Brown coordinates our fund raising activities. Amy Siedenstrang is our Art Director.

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Letter from the President

Kurt K. Burnham

Bill Burnham received the 2004 Lowell Thomas Champions of Conservation Award from The Explorers Club for his efforts in conservation of birds of prey. Other honorees were Ed Wilson, Gary Comer, Stefanie Powers, and Alan Rabinowitz.

The Peregrine Fund works in a highly political world. Possibly the most politicized aspect is endangered species recovery in the United States. Because of these politics we now work to recover species in spite of, rather than because of, the Endangered Species Act (ESA). This is evidenced by the U.S. Fish and Wildlife Service (FWS) having to find exemptions within the ESA, such as Safe Harbors and Nonessential Experimental Populations, under which essentially to re-classify the Aplomado Falcon and California Condor in order to remove public and private opposition so these species can be recovered.

The ESA has become a primary tool used by those who wish to stop almost any action even remotely connected to the environment. Nowadays, environmental issues are regularly not debated on their merits, but instead on some existing or proposed endangered species. Associated lawsuits are requiring the FWS and other government agencies to either give in to litigators or daily battle in the courts across this nation consuming precious ESA funding. Critically needed dollars for on-the-ground species recovery actions go instead for lawyers and court fees. Private landowners retreat at even the mention of endangered plants and animals. Even if a species is recovered, it is almost impossible to remove it from the list as there are no incentives and probable litigation lurks on the horizon if tried. Directors from the FWS recently told me (1) the ESA is broken, (2) very little is being accomplished, and (3) that unless significant changes are made to the ESA they might as well open up their budgets to the litigators and tell them to take what they want.

We believe strongly there should be meaningful debate arguing a case or cause on its substantive merits. Old growth forests, short and tall grass prairies, the sage brush community, and other environments have value in their own right; in fact, a greater value than an endangered species that occurs in any one, although they would be poorer by its absence.

Conserving biological regions and communities, the most important actions needed to preserve endangered species and biological diversity generally, cannot be accomplished using the ESA because it was not adequately designed for that purpose. For example, designations of critical habitat are promoted by environmentalists for habitat protection but remain in effect only so long as a species remains listed, whereas natural habitats need permanent protection. This inconsistency results in misuse of the ESA and resistance to delisting a species even when recovered.

There is no organization that believes more strongly in saving species and our natural world than The Peregrine Fund, and our track record proves it. And, there are few if any groups with more experience recovering terrestrial endangered species. We were doing such work even before the current ESA was passed in 1973. With that commitment and experience we have come to the conclusion that for the nation to be successful at endangered species restoration the ESA must be changed because the original intent for its enactment has been subverted. No change will only mean worsening political and biological situations.

Our general recommendation is to refocus the ESA on incentives. As part of this refocusing, the ESA and it regulation should be simplified. Listing and delisting species, recovery team composition and function, recovery plan process and content, and other administrative changes should be made to enhance function and effectiveness. A stronger state and federal partnership should be established and greater private sector involvement incorporated. In summary, the ESA should be made more effective at conserving species and less burdensome for those it affects, particularly natural resource users.

Unless the ESA is modified, or until the nation has a law focused on habitat and biome conservation, endangered species will continue to suffer from lack of private sector and landowner support. This will continue to produce conflicts over designation of critical habitat and punitive measures; litigation will continue to consume dollars critically needed for recovery actions. Congress should consider passage of a new law dealing with habitat and biome conservation simultaneously with modification of the ESA.

Sincerely,

Bill Burnham
President

There is no organization that believes more strongly in saving species and our natural world than The Peregrine Fund.

Northern Aplomado Falcon Restoration

Goal

Establish a self-sustaining wild population of Aplomado Falcons in the south-western United States and northern Mexico through captive propagation, release, and management with the ultimate goal of removing this species from the Endangered Species List.

When the Spaniards came to the grasslands of Texas and New Mexico, the Aplomado Falcon was part of the landscape. Perched atop yuccas and in the crowns of scattered trees that rose from the green and yellow prairies, the falcons sped on flashing blue-grey wings to chase the abundant birds that thrived in the seed-grasses that brushed the bellies of the Spanish horses.

Once common along the southern gulf coast of Texas and Mexico, and throughout large portions of the American Southwest, the Northern Aplomado Falcon disappeared as a breeding species during the first half of this century as a result of the combined effects of habitat loss, human persecution, and pesticides. Prior to releases by The Peregrine Fund, the last recorded nest within the United States was in Deming, New Mexico, in 1952.

This elegant species is once again breeding along the Gulf Coast of Texas as a result of a successful restoration effort developed by The Peregrine Fund in cooperation with the U.S. Fish and Wildlife Service, the Texas Department of Parks and Wildlife, and private landowners. We shaped the course of a recovery program for the Aplomado Falcon between 1978 and 1989 with 25 wild nestlings collected in Veracruz, San Luis Potosi, Tabasco, Campeche, and Chiapas, Mexico. The propagation of this species remains difficult, highly technical, and labor intensive, with most of the production the result of artificial insemination. Despite these challenges, over 1,100 falcons have been bred in captivity by The Peregrine Fund, and an equally impressive 1,004 young falcons have been released into habitats in Texas where the species had been lost. These releases have resulted in the formation of at least 39 pairs where prior to 1995 there were none.

Moreover, these pairs are now beginning to breed, successfully fledging more than 179 young. The wild breeding population is the result of releases on Laguna Atascosa, Matagorda Island, and Aransas National Wildlife Refuges, and on private property. Our experience with the Aplomado Falcon has shown that habitat descriptions gleaned from historical sources were often quite different from the contemporary habitats selected by the released falcons. "Historical" habitat and "suitable" habitat may be very different in contemporary landscapes.

Excellent Aplomado habitat: a well-managed cattle ranch.

Cal Sandfort

RESULTS

We produced 117 young falcons in captivity in 2004. Five of the young were held back to augment the captive breeding population, now totaling 46 pairs. We released 112 young falcons at two release sites in South Texas (31 falcons) on lands managed by Laguna Atascosa National Wildlife Refuge, and from five hack sites (81 falcons) on private ranches in West Texas. The combined success rate of releases in 2004 was 74%, which compares quite well with the mean success rate of 68% calculated over the last 15 years. We consider a bird to be successfully released if it survives 21 days after release, or when it is no longer dependent on food provided at the release site. The most common causes for loss during release are premature dispersal and predation by other species, including raccoons, coyotes, Crested Caracaras, Great Horned Owls, and Chihuahuan Ravens.

We are constantly trying to increase the success rate and efficiency of releases through new techniques. In 2003 we released 20 falcons from a single site on South Padre Island, a highly successful experiment, with 100% of the falcons reaching independence. In 2004 Tom Cade and Harry McElroy conducted an experiment involving the release of four semi-tame falcons. Enough control over the falcons was maintained so that they could be gathered up each evening and placed in a predator-proof enclosure and released again each morning. All four falcons attained independence, and although labor intensive, this technique could prove useful with this and other species in environments where predation rates would make releases otherwise unfeasible.

Monitoring the Developing Population in Texas— This year, our biologists located 39 pairs of Aplomado Falcons in South Texas and adjacent Taumalipas, Mexico. Thirty-two (82%) attempted to breed. We placed artificial nest structures at 23 locations where we have known Aplomado Falcons to nest in the past. We conducted an experiment utilizing two types. One was a more expensive nest box with barred sides to provide nesting falcons more protection from predators. The second structure was completely open, more similar to nests typically used by Aplomado Falcons such as those built by the Chihuahuan Raven, White-tailed Hawk, and Crested Caracara. The results were quite interesting. Falcons nested on 19 of the structures we provided. Twelve nesting attempts took place on the open platforms, with nine pairs fledging 21 young. All seven attempts in the barred boxes were successful for a total of 18 fledglings. In contrast,15 nesting attempts in natural nests resulted in six pairs fledging 15 young. In summary, pairs using natural nesting structures failed nine times, those using open artificial structures failed three times,

Adult female Aplomado Falcon.

Cal Sandfort

while none of the pairs using barred nest boxes failed. In total, 32 pairs (82%) attempted to breed, including 11 pairs on Matagorda Island and 21 pairs in the Brownsville area to the south. Our biologists attribute much of the 46% increase in productivity to the use of barred nest boxes.

Nest boxes are an accepted management tool with a long history of use with other species, notably the Barn Owl, Mauritius Kestrel, and Wood Duck. These nest boxes can provide an important short-term increase in productivity helpful in the long-term restoration of a viable population.

During fall 2004, we have completed the third year of a concerted effort to individually identify members of all known pairs through band reading. These data are contributing to the development of a population model to estimate the sustainability of the recovering population. Preliminary results suggest an adult survival rate of about 87% which compares favorably with adult survival rates observed in other healthy falcon populations.

Monitoring Populations in Mexico—The Peregrine Fund continues to monitor a small population of Aplomado Falcons in the Mexican state of Chihuahua where we have recorded 200 nesting attempts since 1996. In spring 2004, we located 18 occupied territories in the Tinaja Verde and Sueco study areas. These pairs produced 1.06 young per occupied territory, and overall, the population appears to be declining, most likely as a result of the long period of drought.

Predation appears to be an important reason for reduced productivity, and we are planning to set up five artificial nest structures in each of the study areas prior to next year's breeding season. We monitored grassland prey bird populations at both study sites and installed 20 escape ramps in stock tanks located near falcon territories. In past years we have found falcons that had drowned in the tanks and the escape ramps should mitigate this mortality factor.

Federal/State and Private Land Owner Programs—The participation of private landowners has been a cornerstone of this recovery effort. Many ranchers are justifiably concerned that an endangered species like the Aplomado Falcon could affect their right to manage their lands. In return for access to private property for the release and monitoring of Aplomado Falcons, an agreement called "Safe Harbor" was developed with the U.S. Fish and Wildlife Service. This provides participating land owners with federal guarantees that the presence of the falcons will not result in additional restrictions. Some ranchers have become enthusiastic supporters of this recovery effort and over 1.6 million acres are now enrolled in this program in Texas.

The Peregrine Fund is also working with New Mexico, Arizona, the U.S. Fish and Wildlife Service, and the federal land agencies to develop a "Nonessential Experimental Population" designation under section 10(j) of the Endangered Species Act (ESA) to reduce concerns of public land users, and to facilitate the recovery of the Aplomado Falcon in New Mexico. This designation removes restrictions otherwise imposed by the ESA when falcons are released. After more than two and a half years of negotiations, a draft 10(j) has finally been published in the Federal Register.

Publications—Several important papers were published in peer-reviewed journals this year including a paper in the *Wildlife Society Bulletin* chronicling our efforts over the last 10 years in restoring the Aplomado Falcon in Texas, a paper by Jessie Brown in the *Wilson Bulletin* describing pirating behavior, and a paper by Alberto Macias Duarte in *The Auk* on reproduction, prey, and habitat of the Chihuahua population. Several articles also appeared in popular publications, most notably in the September issue of *Texas Wildlife.* ■

Staff

Director, Peter Jenny; Coordinator, Bill Heinrich; Captive Breeding, Cal Sandfort, Emma Christensen, and Travis Rosenberry; Field Work, Brian Mutch, Angel Montoya, Erin Gott, and Paul Juergens; and Senior Scientist, Grainger Hunt.

Hack Site Attendants

Laura Baird, Tom Cade, Theresa Catanach, Courtney Coleman, Melanie Fischer, Rachel Frame, Casey Goodpaster, Kerry Hosken, Amy Kocourek, Harry McElroy, Jonathan Nelson, Rachel Rabinovitz, Ryan Rager, Nicole Schmaltz, Sarah Walker, Trevor Watts, and Melissa Weitzel.

Cooperators

We cooperate with the U.S. Fish and Wildlife Service, the Secretaia De Medio Ambiente Recursos Naturales Y Pesca (SEMARNAP), the Texas Parks and Wildlife Department, Universidad Autonoma de Chihuahua, and private land owners. Jessie Brown participated as a graduate student. Pathology was accomplished by Bruce Rideout of the San Diego Zoo.

Providing essential financial and/or logistical support were the Lee and Ramona Bass Foundation, U.S. Fish and Wildlife Service Private Stewardship Program, The Meadows Foundation, Ruth O'Donnell Mutch, Houston Endowment, Inc., Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation, National Fish and Wildlife Foundation, Turner Foundation, Inc., Exxon Mobil Foundation, The Charles Engelhard Foundation, Karen and Tim Hixon, Edward W. Rose III Family Fund of The Dallas Foundation, Texas Parks and Wildlife Department, Timpken Family Trust, Burlington Resources, Mr. and Mrs. Charles Price, The Tapeats Fund, World Wildlife Fund, Microsoft/Mike and Carolyn Maples, Magnolia Charitable Trust, The Norcross Wildlife Foundation, Inc., Volare Air Charter, Pete Davidson, and The Sophie Seeligson Bass Foundation.

Goal

Establish self-sustaining wild populations of California Condors through captive propagation, release, and management, with the ultimate goal of removing the species from the Endangered Species List.

The Peregrine Fund is striving to impart an enduring condor population to Arizona and Utah that will require no hands-on management. Progress toward that goal has largely passed through the difficult phase of releasing young, inexperienced condors into a landscape containing no society of experienced older birds to emulate. Condors are evermore apparent in the canyon country of northern Arizona and Utah, and the dream of seeing them as a truly wild and self-sustaining population is beginning to take form. The free-flying population in Arizona and Utah now exceeds 50 individuals, and though all condors return to the release site seasonally, most have learned to forage in the landscape.

RESULTS

Tracking of condors by our biologists shows considerable movement throughout the region. In spring and early summer 2004, as in earlier years, the birds frequented the Colorado River corridor along Marble Canyon and thence to the South Rim of the Grand Canyon, delighting Park visitors with splendid appearances and flights near enough for pictures. On the other hand, the frequency of really close encounters with people has fallen off substantially, partly as a result of consistently applied aversive conditioning (hazing away from undesirable locations), and partly because a now substantial number of older, experienced condors are guiding the behavior of newcomers.

By mid-summer, a group of birds had gone to Utah to reside in the hills just outside Zion National Park until mid-fall. A larger contingent went west to the Kaibab Plateau and to the spectacular cliffs overlooking Kanab Creek, a more remote area of the Grand Canyon. However, when the weather turned cold, the birds returned to the area of the release site where food was always available and where newly-released condors had become an object of interest. And yet the flock did not strictly remain there as in years past, but wandered far and wide with breaks in the weather. The annual cycle of condor movement is therefore evolving, as we would expect of a wild population. Equally exciting are the reproductive events still unfolding (see below) since the appearance of the first wild-produced fledgling in November 2003. The population is reproducing!

Randy Townsend and co-workers at the breeding facility at the World Center for Birds of Prey in Boise produced 14 young condors in spring 2004. Eleven of these were transported this winter in a special climate-controlled vehicle by Norm Freeman, a longtime friend of the organization, to the Vermilion Cliffs where they were held for varying periods for acclimation prior to their debut in wild condor society. Those of good standing in the hierarchy of perching, eating, and interacting with other condors were first to be released. Less wary or submissive birds were held for longer periods, during which their confidence and independence increased. The strategy of releasing condors in winter, when rising air currents are less available for traveling, renders them less likely to blunder into peopled areas, and they are instead given time to integrate with the flock.

Bill Heinrich

Biologists move condors into the release facility at the Vermilion Cliffs after the birds arrive from the World Center in Boise.

We recorded no fatalities in 2004, although two birds went missing and are presumed dead. Their survival and even eventual return, of course, can not entirely be ruled out, given the increasing degree of independence shown by certain birds. Two of three fatalities occurring in early 2005 were attributed to the ingestion of lead shotgun pellets from an unknown source. A third fatality was Condor 305, the first wild-produced individual. The reason for the loss of this bird is still uncertain. In general, the mortality rate during the past three years has been lower than previously recorded, a favorable trend resulting in part from the increased scope and refinement of management procedures.

Lead poisoning from ingested rifle bullet fragments and shotgun pellets from carcasses has emerged as the principal mortality agent recorded among the condor population in Arizona. Our data from periodic screening of blood from condors show levels indicating a high exposure rate. We detected over 50 exposures to lead during 2004 alone, and 20 required treatment. Radiographs of two condors showed visible lead fragments in their stomachs, a condition remedied by a purging procedure administered by veterinarian Kathy Orr at the Phoenix Zoo. How many condors might have died without treatment is not known, nor are the long-term effects of sublethal exposure and treatment known. To date, however, the record shows that even highly exposed condors may later become successful breeders.

We have made substantial headway in understanding the lead issue. A scientific journal article was accepted for publication that details the incidence and extent of rifle bullet fragmentation in deer carcasses, and other lead-related articles are under development. Three articles related to lead exposure are scheduled for submission by our biologists in summer 2005.

Chris Parish

Wild-hatched condor, untouched by human hands.

Condors are evermore apparent in the canyon country of northern Arizona and Utah, and the dream of seeing them as a truly wild and self-sustaining population is beginning to take form.

The Arizona Game and Fish Department is currently urging hunters to voluntarily use non-toxic ammunition in the areas frequented by condors. Such ammunition is increasingly available and receives highly favorable reviews by ballistic experts. The solid copper "X-bullets" made by the Utah-based Barnes Bullet Company are regarded by many authorities as superior for hunting purposes. Arizona hunters have a long history of participation in wildlife conservation and are expected to make a difference.

A study was begun by the Arizona Game and Fish Department to determine the exact origin of lead in the condors through examination of lead isotopes which differ according to the source of the lead, e.g., mine tailings, bullets, etc. They have hired a contractor to compare the lead in the condors' blood to environmental sources of lead and to bullet fragments found in the digestive tracts of condors. In surveys of hunters in Arizona it was determined that they would be more agreeable to any action needed if the necessity was determined scientifically.

Reproduction among wild condors in Arizona reached new highs in 2004, with two pairs producing young. Condors 119 and 122 fledged a chick on their third breeding attempt in as many years from Battleship Cliff in the Grand Canyon, while condors 114 and 149 were successful on their first attempt at the Vermilion Cliffs. Both young condors fledged in November and are alive and well. Several new pairs formed in winter 2005, and among them, 136 and 187 are attempting to nest in a remote recess, deep in Kaibab National Forest. Another pair, 133 and 158, have been observed courting, copulating, nest searching, and nest grooming, all of which forecast success, perhaps even this year.

With the support of the Arizona Game and Fish Department we were able to increase the number of new state-of-the-art satellite-based transmitters for tracking condors. These, combined with the continued use of conventional transmitters, allow for monitoring movements of the condor population, greatly enhancing management and information collection.

FUTURE PLANS

The Peregrine Fund is in the process of producing the 2005 cohort of young condors at its breeding facility in Boise for release next winter. We will continue to analyze the accruing information on the wild population and to improve our data collection processes, management methods, and scientific reporting. We will maintain our schedule of lead testing and will increase our efforts to treat birds on site, thereby reducing the impact of their long transport to other facilities. In this regard, the Arizona Game and Fish Department is helping us to secure a new x-ray machine and other needed equipment for our in-the-field treatment facility. As an essential element of our management program, we will continue to track condor movements by means of both satellite-based and conventional transmitters and will attempt to sort out the relationship between condor locations and mortality risks, particularly lead exposure. ■

Staff

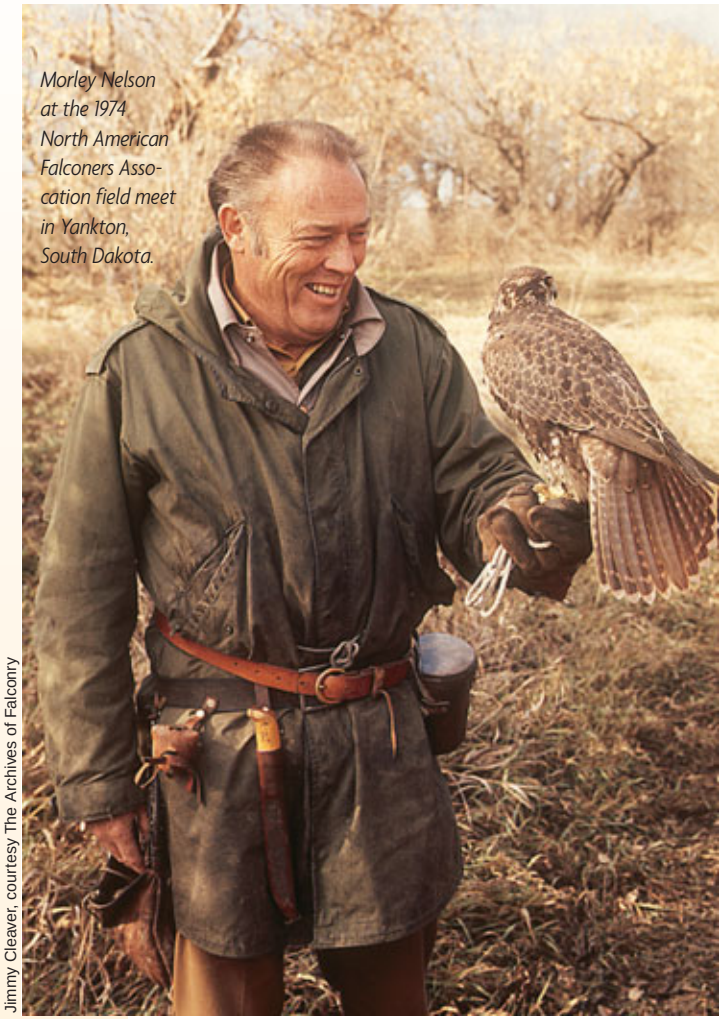
Coordination, Bill Heinrich; Captive Breeding, Randy Townsend assisted by Joe Burke, Megan Kaiser, and Jenny Myers; Reintroduction, Chris Parish and Thom Lord; Research, Grainger Hunt; Research Associates, Brian Mutch and Kurt Burnham; Field Assistance, Roger Benefield, Beau Fairchild, Edward Feltes, Vincent Frary, Michael Maglione, Frank Nebenburgh, Eric Weis, Jonna Weidmaier, and Jim Willmarth; Volunteer, Dave McGraw.

Cooperators

The historic Arizona reintroduction is a joint project among The Peregrine Fund, the Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, Arizona Game and Fish Department, Utah Division of Wildlife, Southern Utah's Coalition of Resources Economics, and others.

Funding and other support for the project was provided by the U.S. Fish and Wildlife Service, National Fish and Wildlife Foundation, Peter Pfendler, Nina Mason Pulliam Charitable Trust, Chichester duPont Foundation, The Charles Engelhard Foundation, Arizona Game and Fish Department, Natural Encounters Conservation Fund, Toledo Zoo, The Kearny Alliance, Patagonia, Conni Williams, The Philadelphia Foundation, Sidney S. Byers Charitable Trust, Globe Foundation, Earth Friends Wildlife Foundation, Norm Freeman, The Philanthropic Collaborative, Grand Canyon Conservation Fund, Salt River Project, Earthquest, the Arizona Strip Bureau of Land Management, and the Phoenix Zoo.

Morley Nelson 1916-2005



Morley Nelson at the 1974 North American Falconers Association field meet in Yankton, South Dakota.

Jimmy Cleaver, courtesy The Archives of Falconry

His actions and enthusiasm for nature and life inspired untold numbers of people, both young and old.

On 22 February 2005 we lost Morley Nelson, a longtime friend and Board member of The Peregrine Fund. He was 88. Although space prevents our detailing Morley's many accomplishments, we provide the following abbreviated list.

1. *Identification and establishment of the Snake River Birds of Prey Area*—It was Morley who, after having returned home as a decorated war hero, recognized the unique biological importance of that area for birds of prey and effectively worked for its protection and various designations, with it eventually being established by the Congress as a National Conservation Area.

2. *Changing the attitude of Americans toward birds of prey*—Morley, in cooperation with friends, film makers, government, and others, helped establish regulations protecting birds of prey and changed the attitude of Americans toward raptors, reducing human persecution.

3. *Preventing electrocution of raptors*—Morley recognized the long-standing problem of raptor electrocution and associated power outages, and even resulting wildfires. In cooperation with Idaho Power Company, and later other utilities, he accomplished research, helped develop guards, and redesigned distribution power lines to reduce electrocution. These efforts have continued and are now in effect globally.

4. *Establishing the World Center for Birds of Prey in Boise, Idaho*—It was at Morley's insistence that when looking for a location to establish a headquarters, The Peregrine Fund considered and eventually chose Boise, Idaho. Morley worked with Governor John Evans, Mayor Dick Eardley and the Boise City Council, the Bureau of Land Management, Idaho Game and Fish Department, President John Keiser of Boise State University, and Boise-based corporations and local citizens to find a location for the facility and to provide other assistance to bring The Peregrine Fund to Idaho.

5. *Researcher*—Morley not only accomplished research on birds of prey, but as a trained hydrologist and snow survey supervisor for the U.S. Department of Agriculture's Soil Conservation Service he established snow surveys to forecast the water supply for Idaho and the Columbia Basin, benefitting farming, hydroelectric utilities, and others dependent upon water run-off. His achievements appear in college hydrology textbooks.

6. *Film maker and actor*—Morley participated in making, and co-starred in, numerous wildlife films throughout his career. Through his own company, Tundra Films, he produced what are now considered classic films on falconry and birds of prey. Working with his children's company, Echo Films, he went on to participate in production of many other films. These films were viewed by many millions of people and influenced their understanding and concern for our natural world.

These are measurable achievements, any one of which is significant. The immeasurable contributions made by Morley may, however, actually be the most important. His actions and enthusiasm for nature and life inspired untold numbers of people, both young and old. We will never know how many people he influenced have and will go on to careers contributing to nature conservation in this nation and internationally.

In honor of Morley and his contributions to the Nation and birds of prey, at the recommendation of The Peregrine Fund, and with the support of the community, on 12 April 2005 the Idaho Congressional delegation introduced a bill in the Congress of the United States to establish the Morley Nelson Snake River Birds of Prey National Conservation Area. The canyon he loved should carry his name and mark Morley's place in history among the great conservationists of the 20th Century. ■

The Archives of Falconry

Goal

Collect and conserve evidence of the history of falconry worldwide and document the role of falconers in raptor conservation.

Although American falconry can be traced back, literally, to the Pilgrim Fathers, the sport had its real beginnings in North America in the 1930s. By the 1980s, however, we began to lose those pioneers of the 30s. With their passing their libraries and collections of falconry memorabilia began to be randomly dispersed. Of particular concern was the loss of historically significant correspondence and photographs which, with no apparent value, were often consigned to the trash. In 1986 those same falconers who had stepped forward to help thwart the predicted extinction of the Peregrine founded within The Peregrine Fund the Archives of American Falconry to collect and preserve the historical record of this sport which had originally brought them to the Peregrine. Now, almost 20 years later, that Archives, unique in the world, has grown to include an extensive library and an invaluable resource of art, equipment, correspondence, photographs, manuscripts, and memorabilia accessible to falconers, scholars, and the general public.

Jack Cafferty

Kent Carnie (right) shows visitors Kelly Cosho (center) and Johan Hess a copy of Jim Enderson's new book, Peregrine Falcon (available for purchase through The Peregrine Fund).

RESULTS

Because of the brief history of American falconry compared with the millennia in which the sport has been practiced elsewhere in the world, many of the books and much of the equipment gathered by beginning American falconers was of foreign origin. Although donated almost entirely by American falconers, our collections contain falconry materials from around the world. In 2004, reflecting this international orientation and our unique world status, we have formally re-christened the Archives of American Falconry as The Archives of Falconry (TAF)!

The Peregrine Fund board member and long-time TAF supporter Jim Enderson generously gave us an original acrylic and 25 stunning pencil renditions by Colorado falconer-artist Bob Katona which Jim had commissioned for his new book recounting his lifetime association with the Peregrine. Heinz Meng donated three of his large original watercolor renderings of Peregrines, also providing funding for the archival framing of two of these works making our preservation efforts all that much easier. Ritt Enderson, Jim's son, added an original watercolor of an immature Cooper's Hawk, coincidently also done by Heinz. Wisconsin falconer-artist Jonathan Wilde presented our Archives with a very impressive large watercolor—a winter scene of a Sharp-shinned Hawk in a bare tree. In the background is the Wisconsin home of the late, acclaimed Fran Hamerstrom. Kent Carnie and John Swift donated two additional Wilde paintings for TAF's collections and Kent placed a third on permanent loan to TAF.

Judy Gardner presented us with a number of original renderings by her late husband, Byron, who designed the logo for the North American Falconers Association. Mark Upton gave us a high-quality print of an Arab falconer drawn from life, the British Falconers' Club gave TAF a series of prints by Andrew Ellis, Jean Sherlock shared several of her stunning raptor prints with us, and Frank Beebe gave TAF some of his earlier artistic efforts, including some magnificent seabird studies. This year deserves to be termed the "year of the artist."

Frank Ely presented us with the first installment of books from his own library, adding new titles and upgrading others to be reflected on our library shelves and in next year's silent auction.

This year we published Volume III in the Archives' Heritage Publication Series: a 550-copy edition of Sir Thomas Sherley's *A Short Discourse of Hawking to the Field with High Flying Long-winged Hawkes.* Its reception has been outstanding and some 90% of the copies have already been sold. The edition is expected to be out-of-print within the coming year. We are now turning our considerations toward selection of Volume IV for the series.

In 2004 the Archives, in cooperation with the British Falconers Club through Associate Peter Devers and British Associate Paul Beecroft, coordinated fundraising efforts for the restoration and marking of the time-obscured gravesites of two famous 19th Century British authors, Gerald Lascelles and E. B. Michell, whose writings served as the literary foundation for American falconry in the 20th century. Special rededication ceremonies in May 2004 were well attended by representatives from both countries.

FUTURE PLANS

We must now focus on means by which our collections may be made more readily available to an international constituency. Digitalization and increasing on-line capabilities will play a large part in improving access to our collected materials. Given the difficulties faced by our Associates in locating memorials of historic British falconers, a memorial statue and commemorative wall are planned for installation at TAF to recognize the legacy that has been handed down to us by those falconers who have gone before.

Plans are already underway for a celebration next year commemorating The Archives' 20th anniversary. These past 20 years have witnessed successes undreamed of when we first undertook to collect and preserve the history of this sport so intimately associated with The Peregrine Fund. ■

Staff

Founding Curator/ Archivist, S. Kent Carnie; Curator of Books and Manuscripts, John R. Swift; Research/Editorial Associate, William G. Mattox; Research Associates, Paul Beecroft, Peter Devers, and Natalie Nicholson; and Graphics Associates, Don Garlock, Jim Hansen, and Jim Stabler.

Cooperators

The Archives is dependent on the support of many friends, falconers and non-falconers alike. Particularly noteworthy assistance was received from Bob and Carol Berry, Gary Boberg, Ralph Buscemi, Kent Carnie, Frank Ely, Jim Enderson, David Frank, Walter Hill, the North American Falconers Association, and John Swift.

Student Education

Goal

Provide research and educational opportunities for students nationally and internationally to further science and conservation.

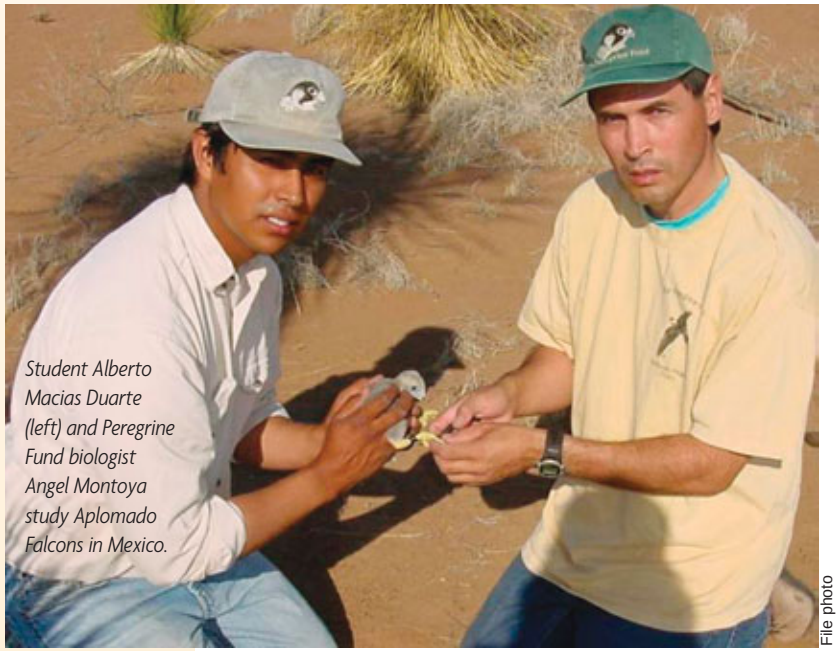
By The Peregrine Fund providing opportunities for college students, lasting benefits to conservation of birds of prey and scientific knowledge result. We are investing in people who we believe will make an important difference. The ultimate goal is to have one or more highly motivated, educated, and trained raptor biologists for every country in the world. Within our financial ability, each year we work to that end. The following table reflects how we are doing toward that objective.

RESULTS

	Doctorates	M.Sc.	B.Sc.
Students who have directly worked with us	18	50	13
Currently working with us on degree programs	3	7	1

FUTURE PLANS

We will continue supporting students financially and in other ways as possible, and particularly in countries where we are actively working. ■



Student Alberto Macias Duarte (left) and Peregrine Fund biologist Angel Montoya study Aplomado Falcons in Mexico.

File photo

Research Library

Goal

Establish and maintain a comprehensive ornithological and conservation biology research library related to the mission of the organization and of major importance to the entire conservation community.

Our library began in 1994, partly in response to the lack of an adequate biological library in the Intermountain Region. Our collections have subsequently grown by leaps and bounds, thanks to many splendid donations of private libraries and funds, eventually necessitating the construction of a new building to house them. We moved our entire library into the Herrick Collections Building in September 2002, and it took us nearly until the end of 2004 to complete the reorganization of our holdings and to create computerized catalogs to facilitate their use.

RESULTS

By the end of 2004, our library collection contained over 16,000 titles, mostly on birds, and partial or complete runs of over 1,300 journal and magazine titles. The catalogued reprint collection includes nearly 17,000 records, with at least another 10,000 awaiting cataloging. We presently receive 174 technical journals, 34 conservation magazines, and 114 newsletters by subscription or exchange. We estimate that our research library now ranks among the 10 largest collections on birds and related natural history topics in North America.

Computerized versions of the library catalog, reprints catalog, and journal inventory were further refined and maintained on The Peregrine Fund web site, where they can be searched or downloaded by any interested student or researcher anywhere in the world. Although awareness of our library has been created mostly by word-of-mouth advertising, we are becoming increasingly well known in the international conservation community. Using a high-speed document scanner, we provided free pdf copies of 696 articles in our collection to 131 off-site researchers representing 30 foreign countries and 16 states in 2004. The library collections also enjoyed increased use by the resident World Center staff and other local biologists.

Computerized versions of the library catalog, reprints catalog, and journal inventory...can be searched or downloaded by any interested student or researcher anywhere in the world.

Over $75,000 worth of library items were received from 26 individual and eight institutional donors, including Louis Best (Iowa State University), Russ Ciochon (Iowa City, Iowa), Robert W. Dickerman (University of New Mexico), Lois Grau (Davis, California), Joseph R. Jehl, Jr. (Annapolis, Maryland), H. Lee Jones (Chino, California), Pat and Don Keane (Mt. Prospect, Illinois), John Maestrelli (Sun Prairie, Wisconsin), William Mattox (Boise, Idaho), Ian Newton (United Kingdom), Leonard Peyton (Fairbanks, Alaska), J. Michael Scott (University of Idaho), Daniel Tufford (University of South Carolina), Herb Wilson (Colby College, Waterville, Maine), Edward Grey

Institute of Field Ornithology (Oxford University, United Kingdom), USGS Patuxent Wildlife Research Center (Laurel, Maryland), Virginia Society of Ornithology, and the Wisconsin Society for Ornithology. We joined the American Library Association's Duplicates Exchange Union in 2004 and received 85 donations of journals and books from other libraries representing 28 states. In addition, exchanges were made with several other institutional natural history libraries which resulted in useful additions to our collections. Over $4,000 worth of duplicate books and journals were sold from the library to help support the acquisitions program.

FUTURE PLANS

It is expected that our Research Library will continue to grow in size and global significance. At a time when some libraries are replacing books and journal runs with digital versions, we are seeking to preserve paper copies. We are also creating a parallel electronic library on CDs and other media, as more and more publications become available in electronic form. Our library has become a significant international conservation resource primarily through generous donations of funds and publications from many persons, whose names are listed on our web site. We welcome additional donations to the library, all of which are tax deductible. ■

STAFF

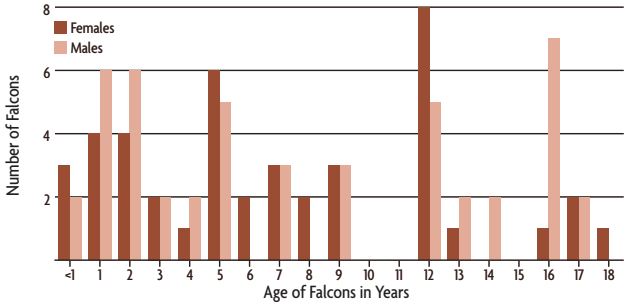
The library is supervised by Lloyd Kiff, who is ably assisted by Library Assistant Travis Rosenberry. Lynda Leppert continues to provide valuable bibliographic services.

Goal

Propagate the required number of the best possible physically, behaviorally, and genetically constituted raptors for release to the wild.

APLOMADO FALCON RESULTS

We had 35 Aplomado Falcons lay 286 eggs, of which 151 (53%) were fertile. One hundred twenty (79%) hatched and 117 (97%) survived to release age. Three of the laying falcons laid for the first time. Three falcons that laid in 2003 did not lay eggs in 2004. No nutritional or disease-related problems occurred. The graph illustrates the sex/age distribution of our current captive Aplomado Falcon population and compares 2004 production with four previous years.

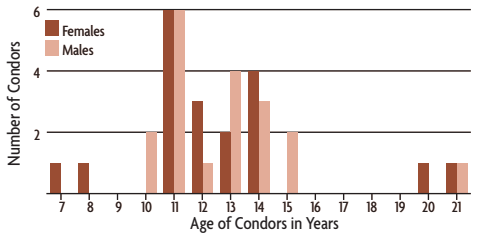


Year	Total Females Laying/Laying Fertile Eggs	Total Eggs Laid	Fertile Eggs	Young Hatched	Young Survived
2000	29/26	253	145 (57%)	118 (81%)	115 (97%)
2001	32/27	284	170 (60%)	131 (77%)	129 (98%)
2002	35/32	281	162 (58%)	124 (77%)	120 (97%)
2003*	34/24	297	111 (37%)	93 (84%)	90 (97%)
2004	35/29	286	151 (53%)	120 (79%)	117 (97%)
Total	—	**1,401**	**1,566 (55%)**	**1,238 (79%)**	**1,116 (90%)**

**Production decreased because of financial donation shortfall.*

CALIFORNIA CONDOR RESULTS

We have 19 pairs of California Condors at the World Center for Birds of Prey for breeding. When we established the captive flock, almost all Condors were young, sexually immature birds. As the population grew older, more females laid and pairs began to copulate. As the condors become older and more experienced, we expect reproduction to continue to increase. ■



Year	Total Females Laying/Laying Fertile Eggs	Total Eggs Laid	Fertile Eggs	Young Hatched	Young Survived
1995	2/0	4	0 (0%)	—	—
1996	5/1	8	1 (13%)	1 (100%)	1 (100%)
1997	8/2	9	2 (22%)	1 (50%)	1 (100%)
1998	9/4	14	6 (43%)	6 (100%)	6 (100%)
1999	11/4	17	5 (29%)	4 (80%)	4 (100%)
2000	19/7	26	8 (31%)	7 (88%)	7 (100%)
2001	17/10	21	15 (71%)	13 (87%)	13 (100%)
2002	17/8	19	11 (58%)	8 (73%)	8 (100%)
2003	19/15	23	17 (74%)	13 (76%)	13 (100%)
2004	18/14	29	22 (76%)	17 (77%)	15 (94%)
Total	—	**170**	**87 (51%)**	**70 (80%)**	**68 (99%)**

STAFF

Captive propagation at the World Center is accomplished by Cal Sandfort (Aplomado Falcons) and Randy Townsend (California Condors) with assistance from Joe Burke, Emma Christensen, Megan Kaiser, Jenny Myers, and Travis Rosenberry. Food production is managed by Amel Mustic with assistance from Roy Britton and Dalibor Pongs. Facility maintenance is under the direction of Sam Davila.

COOPERATORS

Major financial assistance for California Condor propagation is provided by the U. S. Fish and Wildlife Service. Financial support for Aplomado Falcon propagation is listed within that project report. Important financial assistance was provided by The Steele-Reese Foundation for facility renovations. Pathology and veterinarian support are provided by Meridian Veterinary Clinic (Scott Higer), the Zoological Society of San Diego (Bruce Rideout), Washington State University (Lindsay Oaks), the Idaho Department of Fish and Game, Wildlife Health Laboratory, Caine Veterinary Teaching Laboratory, and The Raptor Center (Pat Redig).

Education Program

Goal

To educate the public and students about birds of prey and the importance of their conservation, focusing on The Peregrine Fund's numerous successes.

Public education has played an integral role in The Peregrine Fund's many successes over the years and the organization remains committed to providing a high quality, science-based education program. We are committed to offering adult and student programs that feature our raptors as a lens for learning. The Velma Morrison Interpretive Center is the headquarters for the Boise-based education program. The informative and interactive facility provides visitors of all ages with a face-to-face encounter with birds of prey that leaves a lasting impression. The average educational visit to the Center lasts approximately 90 minutes and trained volunteers conduct ongoing tours daily. With more than 10,000 square feet of buildings, over a dozen falcons, hawks, owls, eagles, and vultures, and information on birds of prey from the Arctic to the tropics, the facility and experience are unique. Displays and educational curriculum are continually updated to ensure the facility and volunteers are providing current and factual information to visitors.

Jack Cafferty

A busy day at the Velma Morrison Interpretive Center.

Jack Cafferty

Captive-produced female Ornate Hawk-Eagle donated by Bob Berry for the Education Program.

RESULTS

More than 38,500 people were reached in 2004 through on-site and off-site educational presentations. A total of 27,400 people visited the Center, including 6,289 students from 225 classes on school-sponsored visits. A 43% increase in student participation occurred this past year, in large part due to our free classroom admission program and expansion of student activities. Of the 101 schools that visited, 24 (23%) were low-income schools. Visiting schools were from 27 communities in Idaho and Oregon.

We expanded our off-site educational programs making 41 presentations to 11,118 people, 19 at schools. More than 4,340 visitors signed our visitor log and all 50 states were represented plus 30 foreign countries. Most foreign visitors were from Canada, Great Britain, Japan, Germany, Afghanistan, Singapore, France, and Australia. Referrals from friends and family continue to be the number one reason why visitors come to the facility.

Our primary goal for FY04 was to expand the entire education program and increase the awareness of the facility and our activities. A marketing plan was organized and implemented to inform teachers of our free classroom admission program for all accredited schools. We distributed information that outlined the available tour options and informed teachers of our willingness to customize educational presentations to meet their specific needs.

An experienced teacher was hired to oversee the school tour portion of the education program. The new education program coordinator completed the development of our school tour curriculum, as it pertains to the Idaho State Board of Education Standards, outlined how our program fits within the State's mandatory guidelines, and increased our visibility in the education community. In addition to biology and ecology requirements, cross-discipline tours were introduced which also meet history, social studies, art, and anatomy curriculum guidelines. We also established a presence within the Idaho education community and hosted a Project WILD-sponsored teacher workshop at the facility focusing on raptors.

We added an immature female Bald Eagle, a male Peregrine Falcon, and a female Ornate Hawk-Eagle to the program this year. The female Bateleur Eagle and male Northern Harrier both were added to the "hands-on" portion of the program and both are regularly shown to visitors. Inside the facility, we replaced the LCD projector used for the presentation of the *Jungle Awakenings* show with an updated and more efficient projector. The *Birds of Prey: Their Biology and Ecology* show was also transferred to a DVD format and a new LCD projector and sound system were installed in the theater. New color

Jack Cafferty

Above: Meridian, Idaho, teacher Bob Beckwith dissects owl pellets with his students Eric Haws and Alyssa Stemple.

Brian Porter / Porter's Photography

Jack Cafferty, Education Program Director, talks about birds of prey and The Peregrine Fund at a community Earth Day celebration.

signs were created and mounted in front of all the outside bird chambers to clarify informational facts on each of the birds.

At an event celebrating the 20th anniversary of the World Center, Tom Cade gave a short presentation on the history of the facility and the success of the organization over the years. A variety of Peregrine Fund memorabilia was on display. More than 600 people attended the event.

This program would not be possible without the efforts of our dedicated group of more than 90 volunteers who donated 6,900 hours in 2004. This enormous volunteer effort allows us to keep our operating costs low and provide an educational program that invites visitor interaction. Our volunteers participated in a wide variety of activities at the facility including leading tours, handling birds, cleaning bird chambers, working in the gift shop, and conducting educational programs for school children. This year marks 20 years of service for two of our volunteers–Bert Cleaveland and Eileen Loerch!

FUTURE PLANS

The Interpretive Center continues to evolve to best meet the needs of our general public and school visitors. Since more and more people are using the Internet as a resource, we will continue to provide additional educational resources through our web site. Displays within the facility will be updated and adjusted where necessary and construction plans for a new exhibit will be made in the coming year, as funding becomes available. ■

Staff

Program and Facility Director, Jack Cafferty; Volunteers and Gift Shop, Joy Zaher; Raptor Specialist, Trish Nixon; Education Programs Coordinator, Cathie Nigro; and Facility Maintenance, Glenn DeSpain.

Cooperators

Financial partners this year include the Laura Moore Cunningham Foundation, Harry W. Morrison Foundation, U.S. Bancorp Foundation, Boise Cascade Corporation, Islands Fund, Bullitt Foundation, Bank of America, Wells Fargo Foundation, Key Foundation, The ConAgra Foods Foundation, Tesoro Petroleum Companies, Weyerhaeuser Company Foundation, Gannett Communities Fund/Idaho Statesman, Bechtel/INEEL, and numerous individual donors.

Volunteers contributing over 50 hours of service in 2004

Jane Anson, Pat Baumback, Gabe Border, Ray Brucks, Gwen Chavarria, Rebecca Chavarria, Bert Cleaveland, Louis DeWitt, Leo Faddis, Claudia Fernsworth, Don Fox, Joni Frey, Bill Gehring, Martin Greitzer, Kathryn Hampton, Amy Hazekamp, Tim Hazekamp, Kathryn Hobson, Ann Jones, Ruth Kassens, Connie Leavitt, Eileen Loerch, Pam Lowe, Kip Malone, Paul Malone, Mike McSweeney, Milt Melzian, Jack Osgood, Brit Peterson, Ron Price, Cathy Quam, Randy Rasmussen, Nikki Sartin, Nancy Schlossman, Ellen Shaw, Kendra Smith, Chan Springer, Charlie Stone, Diann Stone, Jeff Stonelake, Janie Stubson, Dick Thatcher, Monica Villanueva, and Paul Wolters.

Arctic Program

Goal

Conserve and understand Gyrfalcon and Peregrine Falcon populations and their environments in Greenland and other arctic areas.

Our work in the Arctic is focused primarily on Peregrine Falcons and Gyrfalcons. We have a long history achieving results in the far north on falcons, and particularly in Greenland, the largest island in the world. Historically, in Greenland the effect of humans on wildlife had been minimal and mainly limited to subsistence hunting. With increased technology, such as motorboats and large fishing ships, along with greater financial resources, many local wildlife populations have declined and some even have been extirpated. Climate change is an additive and possibly a more important factor affecting falcon populations (positively or negatively). Good information is needed to guide conservation of species.

In an article by Tom Cade et al. in 1998 about Gyrfalcons, they reported of all countries where that species breeds, recent information was most lacking from Greenland and Russia. In Greenland, while helping guide species conservation we have an opportunity to correct this deficiency and expand our knowledge of arctic falcons. Studying falcons in areas where limited human contact has occurred, as well as in human-dominated environments, we can measure direct human-caused changes and those from environmentally-caused factors. To understand how Gyrfalcon and Peregrine populations have responded to these pressures we are monitoring nest sites, collecting information on occupancy and reproduction, and using cutting-edge technology.

What has been achieved through our efforts? Combined with the work of Bill Mattox, we now have long-term information on Peregrines and Gyrfalcons in the Kangerlussuaq area (1972-present) and data on those species for North Greenland since 1993. Our knowledge of the falcons in East Greenland is also being expanded by our efforts and through a cooperative endeavor with Oli Nielsen, the Icelandic Gyrfalcon expert. From the long-term research and monitoring we have a wealth of basic biology and ecology information about falcons in Greenland. In recent years we have not only pushed the envelope into previously unknown geographic areas (North and East Greenland) but also the use of modern scientific techniques. These include genetics analysis (microsatellites to compare populations and gene sequencing to see how populations are related), satellite tracking (home range, migratory routes and rates, and wintering areas), and carbon dating (long-term use of nest sites).

Calen Offield

Access to some remote falcon eyries requires the use of helicopters.

From the standpoint of measurable results, we now have over 250 unique DNA samples from Gyrfalcons from Alaska, Canada, Greenland, and Iceland. To illustrate the level of effort, Kurt Burnham personally handled 100 wild nestling and flying Gyrfalcons this past season alone. There are about another 100 samples for Peregrines from Kangerlussuaq and North Greenland. Along with these DNA samples we have body measurements from many of the same birds (immatures and adults) which allows for further comparisons. In addition we have satellite tracking data from over 30 falcons from Greenland and carbon dating results from over a dozen eyries with the oldest site having had about 2,500 years of more-or-less continual use and several others of about 1,000 years of occupancy. Added to these data is a wealth of more traditionally collected information on reproduction, mortality, eyrie characteristics, etc. All this information is presently being analyzed and written up for publication.

Immature female Gyrfalcon, fall 2004.

Cal Sandfort

RESULTS

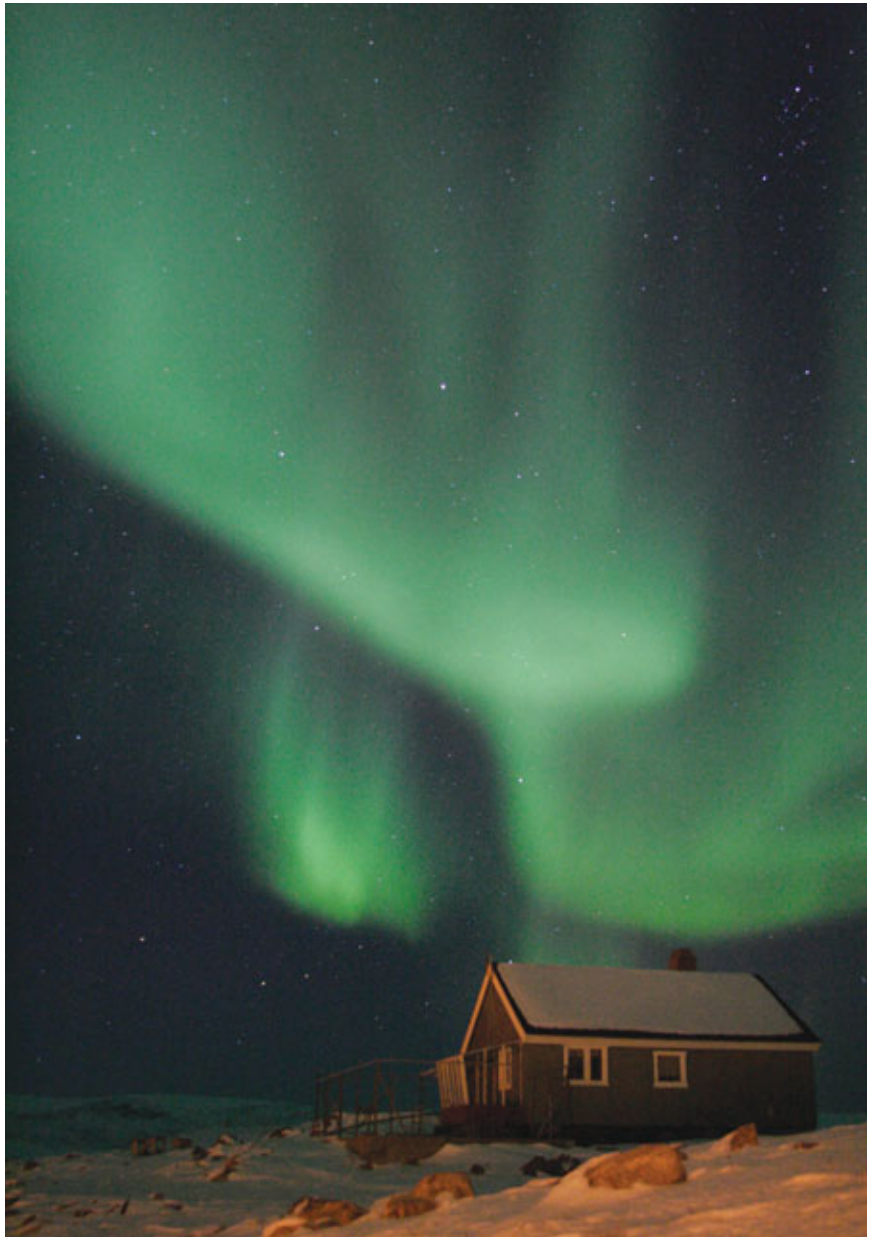
West Greenland—In the Kangerlussuaq area we surveyed 60 known Gyrfalcon eyries, finding 11 occupied and nine producing young. We collected DNA samples (2-3 drops of blood and/or feathers) for genetic analysis from all nine productive Gyrfalcon eyries and samples for carbon dating from six Gyrfalcon nest sites having obvious long-term use. We captured and removed a satellite-monitored transmitter (PTT) from an adult female Gyrfalcon first caught in 2003 and captured three unmarked adult female Gyrfalcons and six unmarked adult Peregrines and took measurements and genetic samples from all. We continued to monitor Peregrine eyries in the Kangerlussuaq area, banding nestlings and collecting DNA samples. Over 20 Peregrine nest sites were surveyed one or more times.

North Greenland—We located nine occupied Gyrfalcon eyries and all produced young. We obtained genetic samples from each eyrie and from six active Peregrine Falcon eyries we located. One former Gyrfalcon nest site was found being used by Peregrines that had four large young.

Kurt K. Burnham

Left: Gyrfalcon nestlings, Iceland.

Below: Nature's light show at falcon trapping station, East Greenland.



Cal Sandfort

East Greenland—At Scoresbysund we established two falcon capture and release sites, catching a total of 38 Gyrfalcons of which 10 had PTTs attached and all birds were banded. Blood samples were collected and measurements taken from each falcon. This is the first time capture and release of migrant falcons has been accomplished for East Greenland, although in 1928 over 250 migrant Gyrfalcons where shot in this area for museums. One Snowy Owl was also captured and released.

Alaska—Chad Cyrus visited 13 Gyrfalcon eyries in Alaska to collect DNA samples. Thanks to excellent cooperation from Alaskan falconers, we were also able to obtain samples from 30 captive Gyrfalcons previously taken from the wild, greatly increasing the sample size.

Iceland—To expand the regional comparisons and understanding of Gyrfalcons, DNA was also collected in Iceland. Accompanying Ólafur Nielsen, Kurt Burnham visited 45 Gyrfalcon territories and they collected DNA from 26 of the sites.

FURTHER PLANS

The greatest emphasis for 2005 will be completing the analysis and writing up the extensive results already achieved. For example, for one falcon carrying a PTT we may have a thousand locations to consider. Publishing results is key to allow use by other biologists, conservationists, and government officials to help guide species conservation and expand scientific understanding. Within study areas, field work will include resurvey of all known Gyrfalcon nest sites in West and North Greenland and Peregrine eyries in North Greenland. At every opportunity we expand the search envelope northward into North Greenland. A sub-sample of known Peregrine eyries will be monitored in West Greenland. As appropriate we will continue to collect genetic samples and other information when visiting eyries and handling falcons. Investigation of long-term use of falcon nest sites will continue. When falcons are located wearing transmitters, we will attempt to capture the falcons and remove the PTTs. For the second season we will operate falcon capture stations in East Greenland, testing to see if this may be a suitable method for monitoring the Gyrfalcon population on Greenland's northeast coast. ■

Staff

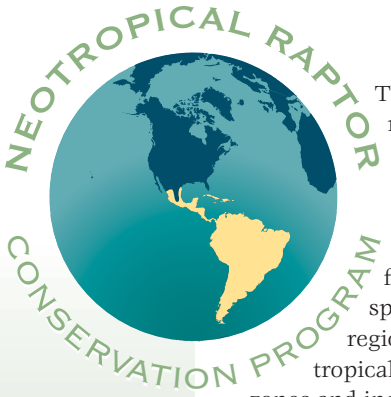
Program direction is accomplished by Kurt Burnham with the assistance of Bill Burnham and scientific advice is provided by Ian Newton and Bill Mattox. Jack Stephens manages our field station, the High Arctic Institute, at Thule Air Base. Jack Cafferty assists with travel authorizations and other logistical needs, particularly while field research is underway. Participating in the field work in 2004 were Bill Burnham, Kurt Burnham, Jack Cafferty, Chad Cyrus, Bill Heinrich, Jim Mussell, Brian Mutch, Ruth Mutch, Ólafur Nielsen, Calen Offield, Cal Sandfort, Matt Solensky, and Jim Willmarth. Genetic analysis is accomplished with the cooperation of Jeff Johnson and David Mindell at the University of Michigan.

Cooperators

Work in Greenland is in cooperation with and authorized by the Commission for Scientific Research in Greenland, Greenland Home Rule Government, the Danish Polar Center, and the U. S. Air Force. The U.S. government sponsor is the Department of the Interior/Bureau of Land Management. Special thanks to the residents of Thule Air Base, the 109th Air National Guard, National Science Foundation, VECO Polar Associates and Robin Abbot, Tom Quinn, Earl Vaughn, Ed Stockard, and Susan Zager, and Basse Vaengtoft and Kate Bahr Friis of the Kangerlussuaq Science Support Services, Greenland. We value the longstanding cooperation with Kaj Kampp and Copenhagen Zoological Museum.

In Alaska our activities were authorized by the Alaska Department of Fish and Game with special assistance from Kim Titus and Wayne Regelin. We also thank the falconers in Alaska for generously providing genetic samples from their Gyrfalcons. Activities in Iceland were authorized by the Iceland Ministry of the Environment with Ólafur Nielsen of the Icelandic Institute of Natural History.

Financial support was provided by Ruth and Brian Mutch, Paxson Offield, Peter Pfender, and NSF/VECO Polar Resources.



Goal

Conserve Neotropical raptors, their habitats, and biodiversity through research, conservation interventions, public education, and development of local capacity for science and conservation.

The Neotropical biogeographic region encompasses the Caribbean and Central and South America to the southernmost tip of the continent. This program focuses on the 98 raptor species that breed in this region, which ranges from tropical to sub-Antarctic climate zones and includes many diverse ecosystems from lowland tropical rainforest to high tundra. The program aims to achieve conservation of raptors known or likely to be in jeopardy, such as the Ridgway's Hawk and Harpy Eagle; improve knowledge and conservation of raptor species for which too little is known to determine their status; answer important land management and conservation questions using raptors' ecological needs as a yardstick for conservation; influence human behavior using raptors as a flagship for conservation of biodiversity; help conserve important tracts of habitat by providing factual information; and provide leadership and develop capacity for raptor conservation and research in Latin America. The program is run from our Panama office, Fondo Peregrino-Panamá, where the Neotropical Raptor Center is located. Major projects are described separately in the following pages.

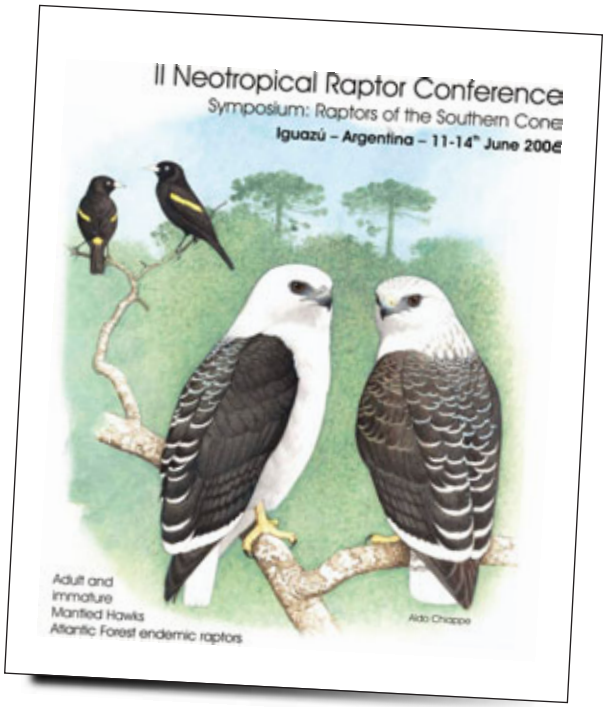
RESULTS

Important improvements in the capacity of Fondo Peregrino-Panamá were made in 2004 with the recruitment of key personnel, including a Ph.D. biologist to direct research on Neotropical raptors, a captive propagation specialist, a Harpy Eagle hack site manager, and an environmental education assistant. We completed a financial sustainability plan and have begun recruitment of a development assistant to help with raising funds locally in Panama. We also pursued partnerships with the banking and business communities of Panama, a step towards ensuring the longevity of our program and building infrastructure for the long-term conservation of Neotropical raptors.

The renewal of our cooperative agreement with the National Environmental Authority of Panama (ANAM), including a concession of 182 ha of forested land for the Neotropical Raptor Center, was signed for another five years. Important cooperative agreements were signed with the Nasso Teribe indigenous Indians in the Bocas del Toro region.

Ocean to Ocean Project—In the fall of 2004 we participated in the first systematic raptor migration count in Panama by counting raptors from Gunn Hill, the location of our Neotropical Raptor Center. Over three million raptors of 15 species were counted in six weeks as they flew over a line of count sites that collectively spanned the width of the isthmus along the Panama Canal.

Neotropical Raptor Network (NRN)—The NRN is a project within the Neotropical Raptor Conservation Program (NRCP) that aims to improve raptor research and conservation in the Neotropics by enhancing communication and collaboration among people working with raptors across the Americas. This year the NRN took important steps forward when we convened the first NRN Advisory Board in Panama to establish the principles on which the NRN will operate and develop into an independent organization in the future. The Advisory Board selected Iguazu, Argentina, as the venue of the Second Neotropical Raptor Conference, scheduled for 11-14 June 2006.



Details can be found on the NRN website at *http://www.neotropicalraptors.org/*.

FUTURE PLANS

Fundraising and developing a local advisory Board for Fondo Peregrino-Panamá will be the major priorities for 2005, to include hiring a development assistant to raise funds in Panama. An independent mid-term evaluation will be made for USAID to evaluate progress towards goals and achieving financial sustainability. Fondo Peregrino-Panamá will continue to provide infrastructure, administration, and support for the annual hawk migration count, the Neotropical Raptor Network, and NRCP projects described separately in the following pages. ■

STAFF

The Neotropical Raptor Conservation Program is directed by Rick Watson and Magaly Linares, assisted by Yanina Guevara, Margarita Gordon, Cameron Ellis, who also coordinates the Neotropical Raptor Network, and the project staff listed separately under each project.

COOPERATORS

The partnership of many organizations and individuals makes this program possible, including Autoridad Nacional del Ambiente (ANAM), Autoridad del Canal de Panama (ACP), Fundacion Ciudad del Saber, and the Ministry of Education. We collaborated with the Panama Audubon Society, Smithsonian Tropical Research Institute, Hawk Mountain Sanctuary, and Center for Social Research and Action in the Ocean to Ocean Project. Jacobo Lacs serves on our Board of Directors and provides invaluable support and assistance in Panama.

Financial support was provided by Wolf Creek Charitable Foundation, the United States Agency for International development (USAID), and the James and Barbara Cimino Foundation. The U.S. Agency for International Development has provided economic and humanitarian assistance worldwide for more than 40 years.

Neotropical Environmental Education

Goal

Change human attitudes towards birds of prey, especially Harpy Eagles, to reduce persecution and help conserve their habitat and the biodiversity it contains.

The largest raptor in the Neotropics, and perhaps the most powerful bird in the world, the Harpy Eagle has been a symbol of pride, hunting prowess, and strength for many cultures and communities throughout Central America. Its image is found in colorfully woven traditional baskets, tagua (native seeds intricately carved and painted), molas (quilt-like crafts), and wood carvings by artists in Panama. But modern problems, such as deforestation and human persecution, have led to the decline of this species throughout much of its former range. Our Neotropical environmental education program focuses on the value of raptor species in the ecosystem and the need for habitat protection, as well as dispelling negative myths and misconceptions about species such as the Harpy Eagle.

RESULTS

In Panama, a major advancement in the education program has been recruiting the media to help us disseminate our conservation message to areas which we could not reach on our own or to areas where a constant presence is difficult to maintain. We are currently broadcasting radio messages on a local radio station in Bocas del Toro that have the potential to reach hundreds of Naso and Ngobe-Bugles indigenous Indians and other rural dwellers that live in the area where we are releasing Harpy Eagles. On a national level, we have given interviews for magazines and newspapers, and with an in-kind donation, we projected informational images about the Harpy Eagle to movie-goers at a major Cinemark Movie Theater in Panama City. We participated with the National Office of Science, Technology, and Innovation in a week-long seminar on birds and conservation for 600 high school students, about half of whom are studying to be teachers. Using the winning drawings from a national drawing contest, we published a 2004 calendar that was sold around Panama City. One of the most satisfying achievements this year has been our collaboration with a group of students from Colegio Brader who call their project Mission: Harpy Eagle. This group is composed of roughly 60 students who have developed PowerPoint presentations, DVDs, and activities about the Harpy Eagle which they present to other schools in Panama to teach their peers about the importance of conserving this raptor and its habitat.

We expanded our international education efforts by providing a three-day environmental education training workshop to our partners from the Dominican Republic on successful education techniques that could easily be adapted for conservation and awareness of the Ridgway's Hawk. We also hosted two students from McGill University (Canada) who completed an independent study to evaluate our education methods in a Panama Canal community.

We continue to design education materials, most notably a Raptor Education Guide that will be used in elementary schools throughout the Republic of Panama. It includes general information about raptors and activities for teachers and students. We have also completed the first draft of a more detailed raptor education guide which we will use as a basis for all of our future educational presentations and activities. This guide, *The Nature of Harpy Eagles,* uses the Harpy Eagle to teach about biomes, ecosystems, the role of predators and prey, plants, water and nutrient cycles, and conservation.

FUTURE PLANS

Community education efforts will continue to focus on target communities adjacent to Harpy Eagle release and study sites, while radio broadcasts will reach both local and national audiences. Locally, we hope to expand our collaboration with Mission: Harpy Eagle by inviting them to work directly with students and adults in the communities within the Panama Canal area. With the help of the Ministry of Education, and working at a national level, we hope to publish and distribute the raptor educational guide to all elementary schools throughout the Republic of Panama. Also on a national level, we plan to host the first-ever annual Harpy Eagle Day celebration on 10 April to celebrate the declaration of the Harpy Eagle as Panama's national bird. We were instrumental in that declaration.

Internationally, we will publish *The Nature of Harpy Eagles* education guide on our web site in both English and Spanish to make it available to teachers and environmental educators working in raptor conservation around the globe. We will continue to provide support to our international partners in Belize, Dominican Republic, and other countries as possible. ■

Rick Watson

José Vargas teaches Embera children about Harpy Eagles using costumes and a nest the children built.

STAFF

This project is conducted by Marta Curti, Kathia Herrera, and Adrian Benedetti with assistance in the field from José Vargas and others. Also assisting with the education program were Valerie Lamont, Karen Lillard, and Benjamin Montuto.

COOPERATORS

We collaborate with the Ministry of Education (MEDUC); Autoridad Nacional del Ambiente (ANAM), and Soberania, Chagres, and Camino de Cruces National Parks; Autoridad del Canal de Panama (ACP); Ecological Police; Instituto Nacional de Cultura (INAC); Tierras Colectivas Emberá y Wounaan; Comarca Emberá/Wounaan; Consejo Naso Tjerdi; Smithsonian Tropical Research Institute (STRI); Academy for Education and Development (AED); Parque Metropolitano; and Colegio Brader–Misión: Águila Arpía.

Important financial support was provided by the U.S. Agency for International Development (USAID), Wolf Creek Charitable Foundation, and the Disney Wildlife Conservation Fund. Caribe Estereo and Cinevisión Internacional provided valuable in-kind donations.

Goal

Conserve and restore Harpy Eagle populations through hands-on management, research, and collaboration with local people.

As more of the released captive-bred Harpy Eagles continue to reach independence, they will be captured and relocated to remote areas of Panama and Belize where suitable forest habitat still exists.

Mauricio Ramos

Flying Harpy Eagle carrying a branch to the nest.

Mauricio Ramos

Right: Saskia Santamaría feeds a Harpy Eagle nestling in an imprint chamber, where eaglets are hand-raised in the presence of an adult eagle.

As a top predator, the Harpy Eagle plays an important ecological role in tropical forest ecosystems of Central and South America. Where Harpy Eagles are effectively conserved they act as an umbrella species for others in the food chain below them since they require large tracts of healthy forest habitat in order to survive. Today, human pressures in the form of shooting and deforestation have diminished their populations throughout their range, especially in Central America. Through captive breeding and release, field research, and environmental education we hope to diminish the causes of this species' disappearance, learn more about their biology and behavior, and increase the existing population of Harpy Eagles by restoring the species in areas where it was historically present but where few or no Harpy Eagles remain.

RESULTS

Captive Propagation and Release—Two of our three Harpy Eagle pairs produced four chicks from six fertile eggs. Ten eagles were released in Soberania National Park (SNP) during 2004. Two of these birds were part of the initial releases that occurred in Panama in 1998. Due to potential poaching problems at the time, they were recaptured and experimentally placed in our captive breeding program to test the possibility of releasing them as a pair at a future date. Unfortunately,

Angel Muela

Radio-tracking released Harpy Eagles from a high point in Rio Bravo conservation area, Belize: from left, Sharon Matola, Chris Hatten, Marta Curti, and Ryan Phillips.

Below: A Harpy Eagle defends its nest as our biologist, José Vargas, climbs to band a nestling.

Angel Muela

they never bonded, so we released them independently this year. Both of these birds started hunting almost immediately and are doing well. Another Harpy Eagle released this year is a wild female that had been shot in the wing and brought to us for care. After more than a year of rehabilitation we successfully released her in SNP. Three previously released eagles which are now independent were recaptured in SNP and re-released in more isolated forests in Panama and Belize where they continue to be monitored by air and satellite tracking.

In Belize, due to increased human activity at the Las Cuevas release site, we moved all of our birds to Rio Bravo earlier than planned. We successfully relocated all but one of these eagles. The remaining bird, an independent female, has moved into a rugged area where trapping has proven impossible. We will continue to track this bird from the air until an opportunity occurs to capture and relocate her to Rio Bravo. The remaining eagles in Panama and Belize are all at different stages of development. We predict that most of them will be independent of our care before the end of 2005.

Research and Conservation—Research seeks to understand the population dynamics and factors limiting the distribution and abundance of the Harpy Eagle in the wild. This first-ever study of a large, long-lived tropical forest raptor is designed to continue over many years. We began by hiring and training parabiologists from local indigenous communities who find and monitor Harpy Eagle nests and interact with community members to help conserve the species. Research occurs in the lowland forest of Darien Province, adjacent to the Colombian border, where we work with 19 indigenous communities from Tierras Colectivas Emberá y Wounaan and Comarca Emberá-Wounaan. In 2004 we monitored 23 nests, just five of which began the reproductive cycle which can last up to three years. Radio transmitters were placed on two nestlings to track their behavioral development and dispersal from the nest site. One of the eagles is now about 16 months old and has still not ventured further than 200 meters from the nest. We have completed a study to understand the characteristics of Harpy Eagle nesting habitat by analyzing forest structure data from 10 Harpy Eagle nest sites; the paper is in preparation. A paper on the Harpy Eagle's conservation status throughout its range has been submitted for publication.

FUTURE PLANS

Captive propagation will focus on understanding how to achieve maximum production of Harpy Eagles from available breeding pairs. We may test sibling rescue as a method for increasing production from wild pairs. As more of the released captive-bred Harpy Eagles continue to reach independence, they will be captured and relocated to remote areas of Panama and Belize where suitable forest habitat still exists. Most of the independent birds will be fitted with satellite transmitters so that their movements, survival, and breeding can be tracked for many years with minimal effort. Long-term field studies of Harpy Eagle population dynamics and ecology will continue in Darien Province. ■

STAFF

Field research and conservation are directed by José Vargas with assistance from Rodolfo Mosquera, Dadildo Carpio, Gabriel Minguizama, Eloy Arifio, Bilomar Doviaza, and Rogelio Peña, and volunteers Phillipe Potvin and Calixto Cunampia.

Mary Schwartz and Saskia Santamaría are responsible for captive-breeding, advised by Cal Sandfort. José de los Santos López, Noel Guerra, Próspero Gaitán, Bolívar Rodríguez, Omar Fernández, and Edwin Jiménez raise raptor food and provide maintenance of the Neotropical Raptor Center facilities. Nadia Sureda made important contributions during 2004.

Angel Muela coordinates the release program and is assisted by Marta Curti. Edwin Campbell supervises volunteers at the release site in Panama. Important assistance for the Harpy Eagle release program was provided by the following volunteers in 2004: Adrian Benedetti, Irene Espinoza, Aaron Gallager, Todd Gillen, Mario Guerrero, Kevin Hall, Eric Hallingstad, Phil Hannon, Chris Hatten, Ryan Phillips, Steven Pearson, Diego Johnson, Laura Riba, Tamara Rísquez, Félix Sandoval, Peter Series, and Oscar Vargas.

COLLABORATORS

The Harpy Eagle project depends on the partnership of many individuals and organizations, including, in Panama, Autoridad Nacional del Ambiente (ANAM) and its National Parks (Soberania, Chagres, Camino de Cruces, and Darien), Autoridad del Canal de Panamá (ACP), Autoridad de la Región Interoceánia (ARI), Fundación Ciudad del Saber, Ecological Police, Comarca Emberá-Wounaan and Tierras Colectivas, Smithsonian Tropical Research Institute, Asociación Nacional para la Conservación de la Naturaleza (ANCON), Summit Zoo, and Patronato Amigos del Aguila Harpía.

In Belize we count on the partnership of The Belize Zoo and Tropical Education Center, Ministry of Natural Resources and the Environment, Air Wing of the Belize Defense Force, Programme for Belize, and LightHawk.

Financial support was provided by the U. S. Agency for International Development (USAID), Wolf Creek Charitable Foundation, the Diane A. Ledder Charitable Trust, CEMEX , and the Houston Zoo.

Orange-breasted Falcon Project

Goal

To determine the species' status and consequences of population isolation in fragmented landscapes, and to develop captive breeding and release methods for future species restoration or management.

One of the lesser studied falcons in the world, the Orange-breasted Falcon (OBF) is arguably one of the most beautiful. It is similar in coloration to the Bat Falcon, but is larger and has proportionately bigger feet than its more commonly seen cousin. Orange-breasted Falcons are swift fliers and feed on birds and bats which they catch in flight. They regularly nest on cliff ledges, but also have been found nesting in epiphytes growing on emergent trees. OBFs usually lay three eggs and chicks remain in the nest for about six weeks before fledging.

After conducting studies and surveys for this species, which began in the late 1970s and continue today, we found this elusive falcon appears to be largely absent from suitable habitat throughout much of Central America. A northern population in Belize and Guatemala may be isolated from the species' southern range.

To increase our knowledge of this species and help safeguard it from possible extirpation in portions of its range, we established captive populations at both our Neotropical Raptor Center (NRC), Panama, and at research associate Bob Berry's Wolf Creek Ranch facility in Wyoming. Two colonies greatly reduce the potential for catastrophic loss of all birds and double the opportunity to develop effective captive breeding methods. We began collecting nestlings and eggs for hatching to develop our captive breeding stock in 2001 and expect at least one of these pairs to begin breeding activity in 2005 or 2006.

RESULTS

We surveyed all known Orange-breasted Falcon nests in Panama and Belize in 2004. We located two additional pairs in Belize bringing the total to nine known OBF sites in Belize. Of these nine nests, eight showed nesting behavior and were believed to be incubating eggs or brooding young chicks. As the season progressed, we noticed that most nests had failed and we could only confirm the fledging of one young male. We suspect that natural predation is one of the main causes for this high rate of nesting failure.

In Panama we surveyed all four known nests. We could only confirm the hatching of two nestlings at one site. A second pair appeared to have failed during incubation, while no young were produced at the other two nests.

Angel Muela

Orange-breasted Falcon with eggs at its eyrie.

At the Neotropical Raptor Center, we continued to monitor the breeding pairs closely. Our two pairs were still too young to breed in 2004 but were beginning to show signs of courtship behavior in early 2005.

FUTURE PLANS

We will continue monitoring wild populations of Orange-breasted Falcons in Panama and Belize and, as possible, expand the searches to locate nests in new areas. Due to the high rate of nesting failure that we have witnessed, in the 2005 season we plan to collect eggs during the early stages of incubation and bring them to our facilities in Panama where they will be artificially incubated. We expect a high rate of hatchability and chick survival. Up to three females will be kept as part of our captive-breeding program while all additional birds will be released back into the forests of Belize in a first-ever attempt to release this species by hacking. This management technique most likely will allow the wild pairs to lay a second clutch of eggs in the same breeding season, thereby potentially increasing the year's annual production. These first experimental releases will be a great learning experience for possible future restoration efforts.

STAFF

The field portion of this project is conducted by Angel Muela and Marta Curti. Mary Schwartz and Saskia Santamaría are responsible for captive-breeding, with advice provided by Cal Sandfort. Nadia Sureda made important contributions during 2004. José de los Santos López, Noel Guerra, Próspero Gaitán, Bolívar Rodríguez, Omar Fernández, and Edwin Jiménez raise raptor food and provide maintenance of the NRC facilities.

COOPERATORS

Robert Berry assists as a research associate in developing captive-breeding techniques for this species. Financial support was provided by Wolf Creek Charitable Foundation.

In Panama we work with authorization of the Autoridad Nacional del Ambiente (ANAM) and the Comarca Emberá-Wounaan. Assistance was provided by Piñas Bay Resorts, S.A. In Belize we work with authorization of the Ministry of Natural Resources and the Environment. Valuable in-kind support and assistance were provided by Hidden Valley Inn.

West Indies Project

Goal

Prevent the extinction of raptors found only on the islands of the West Indies and conserve native habitats important for North American migrating birds.

The Caribbean region is known as one of the world's most important biodiversity hot-spots. The islands support a high number of endemic plants and animals as well as a rapidly growing human population that threatens the unique natural environments. We wish to understand the problems and help conserve the rare and endangered raptors in the West Indies—in Grenada the Grenada Hook-billed Kite, in Dominican Republic the Ridgway's Hawk, and in Cuba the Gundlach's Hawk and Cuban Kite. These species are more vulnerable to extinction than continental species because their habitat and range are restricted by the size of the islands.

RESULTS

Grenada—We have conducted surveys throughout the island and found territorial and nesting kites in the southern and central interior, a region in which kites have never previously been reported nesting. We began in 2000 by finding two nesting pairs, and two pairs exhibiting nesting behavior. In 2003, we discovered pairs nesting in the wetter interior forests, providing the first confirmation that kites nest in this habitat type.

Local researcher Desmond McQueen conducted Grenada Hook-billed Kite surveys and monitoring from June to October. He located five nesting pairs in July and August of which three successfully fledged one young each. One nest failed when the adults abandoned it after incubating for 37 days and the nest was later destroyed by Hurricane Ivan. In the past five years we have located and observed 15 breeding pairs plus seven lone adults and two immature birds. Based on one blood sample, the Grenada Hook-billed Kite appears to be a recent arrival to the island, probably within the last 40,000 years, and not resident on the island long enough to separate it genetically from the mainland nominate race. A larger sample size is needed before final conclusions can be drawn.

Dominican Republic—We are focusing on the poorly known and critically endangered Ridgway's Hawk. This hawk was once found throughout the island of Hispaniola but now appears to be limited to a very small area in the northeast, concentrated in Los Haitises National Park. From March to October Jesús Almonte and Samuel Balbuena surveyed for Ridgway's Hawks in the Los Haitises National Park and surrounding area. They recorded 72 territorial pairs of which 33 attempted nesting and six pairs were successful in fledging 11 young. Jesús Almonte and Pedro Rodriguez with Sociedad Ornitologica de la Hispaniola (SOH) visited Panama for a one-week training workshop. The workshop included observation and participation in environmental education programs and evaluations, providing hands-on experience that is now being integrated into a public awareness program on the Ridgway's Hawk. We have been helping SOH and Fundacion Moscoso Puello (FMP) develop the educational and conservation program of the Ridgway's Hawk.

Eladio Fernández

Female Ridgway's Hawk with young.

Cuba—This island, the largest in the Caribbean region, supports a unique biodiversity. We are supporting Cuban biologists to initiate work on the poorly known Gundlach's Hawk and Cuban Kite. In 2004 studies were conducted on five territorial pairs of Gundlach's Hawk in three different locations. Surveys for Cuban Kites failed to find any.

FUTURE PLANS

Surveys and monitoring of the Grenada Hook-billed Kite and Ridgway's Hawk will continue until we have sufficient knowledge to determine their abundance and the most effective conservation interventions for each species. With support and direction from FMP, SOH, and the National Parks Department in Dominican Republic, we are developing a local and national educational and conservation awareness campaign for the Ridgway's Hawk and its habitat. We will conduct surveys for the Ridgway's Hawk in similar habitat in areas outside of the Los Haitises region. In Cuba, our local partners will continue their surveys for Cuban Kites and Gundlach's Hawks. ■

STAFF

This project is managed by Russell Thorstrom.

COLLABORATORS

We work in partnership with the Grenada Dry Forest Biodiversity Conservation Project, Grenada Forestry Department, Alan Joseph, Michael Jessamy, and Desmond McQueen. Independent researcher Bonnie Rusk provided assistance and expertise. In Dominican Republic, biologist Jesús Almonte conducted field work in the Los Haitises region. We collaborate with Dominican Republic National Parks Department and thank them for allowing Modesto (Samuel) Balbuena de la Rosa to assist in the field work in Los Haitises region. Valuable advice was provided by Jim Wiley, United States Fish and Wildlife Service. We collaborate with Carlos Garcia of Fundacion Moscoso Puello, Inc., and Kate Wallace, Pedro Rodríguez, and Eladio Fernández of Sociedad Ornitologica Hispaniola. In Cuba, we collaborate with biologists Arturo Kirkconnell and Pedro Regalado.

Genetic research is accomplished by Jeff Johnson and David Mindell of the University of Michigan.

Financial support for this project was provided by the United States Agency for International Development (USAID), Wolf Creek Charitable Foundation, and The Charles Engelhard Foundation.

PAN AFRICA RAPTOR CONSERVATION PROGRAM

Goal

Conserve raptors and their habitats through research, education, development of local capacity for conservation and science, and hands-on intervention.

About one-third (107) of the world's diurnal raptor species occur in Africa. Of these, 28 species are considered little known and 21 species are in jeopardy. The Pan Africa Raptor Conservation Program is an "umbrella" approach to identifying priorities and providing direction and communication for projects in the African region. It has been in existence as a program since 1990 and should continue as long as there is a need for building local capacity for conservation in Africa. Since its inception, new information has been collected on 27 species, at least 25 students have been supported at M.Sc. and Ph.D. levels, and projects have been conducted in seven countries. Select 2004 results are described separately in the following pages for our Zimbabwe, East Africa, and Madagascar Projects.

Ron Hartley

Soaring Cape Vultures.

2004 RESULTS

Cape Verde Kite Project—The Cape Verde Islands are located about 500 km west of the African country of Senegal in the Atlantic Ocean. This project was established to assess the conservation status of the Cape Verde Kite. Surveys in the fall of 2002 found a mixed flock of presumed Cape Verde and Black Kites. Five kites were captured and blood drawn for genetic analysis. Analyses were based on three mitochondrial genes and compared Black Kite, Red Kite, and Cape Verde Kite museum specimens collected between 1897 and 1924 and the five kites trapped on the Cape Verde Islands during 2002. We found that the historical Cape Verde Kites, including the original specimen, were not unique and scattered within a larger Red Kite group. The recently trapped kites from the Cape Verde Islands were all diagnosed as Black Kites. Our findings suggest that the traditional Cape Verde Kite is not a uniquely different species. We did, however, find evidence that at least one group of Yellow-billed Kites in Africa, traditionally considered a Black Kite subspecies, could be classified as its own unique species. This project has provided important new information about the *Milvus* kite genus. It also contributes to the ongoing debate about the definition of a species, especially in the context of conservation priorities.

Cape Vulture Project, South Africa—Pat Benson continued his long-term population study of the Cape Vulture at the Kransberg colony, now in its 23rd season of study. The gradual decline in numbers of breeding pairs continued with 618 "occupied" sites and 561 "active" (eggs laid) sites, from which 312 nestlings fledged. This is the second lowest number of successful fledglings in a breeding season since this study was started in 1981 (range = 257–578). Of the nesting attempts resulting in hatched eggs, a higher proportion (84.7%) ended with nestlings fledging than in any other year for which complete data exist during this study (range of previous years = 53.2%–81.7%). The third consecutive season of monitoring the Manutsa Cape Vulture colony began in June. There were at least 499 active nest sites at this colony this season from which 349 nestlings fledged. Two sections in books were published and a paper analyzing bones and other materials collected by Cape Vultures was published in the journal *Ostrich*. Six presentations were given to bird clubs and other groups concerning this project.

Bale Mountain Raptor Project, Ethiopia—In this study, Simon Thirgood is investigating the regulatory effects of raptor and wolf predation on the Afroalpine rodent communities of the Bale Mountains National Park. Results will assist in planning conservation action for the raptor community, the endangered Ethiopian wolf, and the Afroalpine ecosystem upon which they depend. The project was initiated in October 2002 by two Ethiopian students, Anteneh Shemelis and Ermias Admasu, whose training and support will help develop local conservation and research capacity. Results are being prepared for analysis and publication.

FUTURE PLANS

Results from the Cape Verde Kite project will be published; no other activities are planned for this project. We hope to expand our conservation, research, and training opportunities to additional countries in Africa, ultimately developing local capacity throughout the continent and its islands. ■

STAFF

Rick Watson directs the Pan Africa Conservation Program.

COOPERATORS

Financial support for this program was provided by grants from the Disney Wildlife Conservation Fund, Paul Tudor Jones, II, David Maritz, and important Board support.

Genetic research is accomplished by Jeff Johnson and David Mindell of the University of Michigan.

Zimbabwe

Goal

Conservation of and research on birds of prey while developing local capacity through training, support, and hands-on conservation.

In 1983 The Peregrine Fund began cooperating with and assisting the Zimbabwe Falconers' Club (ZFC) to investigate the rare Teita Falcon, a species that remains an important focus in Zimbabwe. The program has since expanded to address a wide range of raptor research and conservation issues in the country. Working together with the Department of National Parks and Wild Life Management, the ZFC has led investigations into the effects of DDT on the Peregrine Falcon and other raptors since 1990, and studied the ecology and breeding biology of little-known species, the effects of habitat change on raptors, established captive breeding populations for endangered raptors, and provided educational programs. The ZFC strives to increase local conservation and research capacity as well as awareness of raptors through training programs that benefit both volunteers and wildlife. Faced with the challenges of a swiftly changing country, the ongoing success of the Zimbabwe Project is testament to the effectiveness of collaboration and investing in local capacity.

RESULTS

One of the dominant features of working in Zimbabwe in recent years has been increasing political and social turmoil within the country and a resulting deterioration in conservation ethic. Strife in Zimbabwe forced program leader Ron Hartley to relocate and commute to the study sites from Cape Province, South Africa. Land resettlement and its associated activities in Zimbabwe are precipitating a growing list of threats to raptors and wildlife. An example is the recent death of 70 vultures at a poisoned carcass set to kill two marauding lions in a resettlement area. In the Savé Valley Conservancy we started a before and after assessment of eagles in the invaded areas which now occupy 30% of this wildlife sanctuary with 9,300 dwellings and 13,500 domestic livestock (cattle, goats, and donkeys) on land roamed by wildlife only a short time ago. While 75% of 28 Crowned Eagle nests known in the Savé Valley Conservancy and Malilangwe Reserve were active this year, only five chicks fledged. Low productivity may be related to the dynamics of their main prey, hyrax, and competition with other species. We will continue to investigate these relationships.

Our ongoing pesticide monitoring showed that pesticide levels were all low, consistent with the trend of decreasing contamination over the past 25 years. However, the recent resumption of DDT use for tsetse fly control may reverse this encouraging progress in parts of the lowveld, so continued monitoring of contaminants in raptors is needed.

Only one pair of Teita Falcons was located this year and this pair failed to breed. No Teitas were sighted in Batoka Gorge, their former stronghold in Zimbabwe where our last record of breeding is from 1995. Two of three Teita sites in the northern Zambezi Valley were occupied by Peregrines and the third site was vacant. In contrast, Peregrines appear to be doing well and occupied virtually all of the traditional sites checked. It was encouraging to see two fledged Peregrines at Kariba dam wall, where shell fragments have been thin and productivity poor for several years.

Development of local capacity has been enhanced with a scout-training certification course at the Savé Valley Conservancy and Malilangwe Reserve. Our efforts to highlight the unique raptor communities in these conservancies were advanced by the publication of the *Malilangwe's Raptors* booklet.

FUTURE PLANS

We aim to continue our studies in this period of turbulence to document and gain insight into the effects of changing land use caused by the government's human resettlement program. We will intensify study efforts on the Teita Falcon to better understand factors that limit its distribution and breeding, including captive pairs. ■

Derek Delaharp

Ron Hartley
1950–2005

Ron Hartley's incredible passion and commitment to raptors in general, and falcons in particular, drove the Zimbabwe Project (a partnership with the Zimbabwe Falconers' Club) to unprecedented levels of success in raptor research and conservation, and training of enthusiastic young falconers and biologists. Ron was one of the most vibrant, energetic people we have ever known. His death is a tragic loss to all of us, both professionally and personally.

STAFF

Ron Hartley managed the Zimbabwe Project

COOPERATORS

We collaborate with the Zimbabwe Falconers' Club and the Zimbabwe Department of National Parks and Wild Life Management.

Financial support was provided by Paul Tudor Jones, II and David Maritz. In-kind support was received from The Malilangwe Trust and the Savé Valley Conservancy. Eggs were analyzed for pesticide levels by Richard Shore of the Ecological Risk Section, Monks Wood, United Kingdom.

East Africa Project

Goal

Conduct conservation-oriented research on threatened habitats using raptors as indicators of ecosystem health; help develop local capacity; and increase public understanding of the need to conserve raptors and their habitats.

East Africa's diverse tropical ecosystems harbor nearly 20% of the world's raptor species in addition to a wealth of flora and other fauna. The majority of these are now threatened by habitat destruction, indiscriminate agricultural practices, overgrazing by livestock, hydrological changes, and uncontrolled development due mainly to a rapidly increasing human population. These problems are further compounded by a lack of national environmental legislation that has resulted in enormous biological and economic losses. In particular, wildlife populations have severely declined, forests degraded, and protected areas are under pressure to make way for human settlement. Consequently, populations of raptors such as Crowned Eagles, African Hawk Eagles, Bateleurs, Marsh Harriers, and Bearded Vultures have declined alarmingly, while those of previously common roadside raptors, such as Augur Buzzards and Long-crested Eagles, have also shown marked declines. These declines have been so rapid that there is an urgent need to reevaluate the conservation status of all raptors in East Africa.

Over the last decade, Simon Thomsett and Munir Virani have been conducting raptor research and training and education programs in East Africa. Our primary goal is to identify threatened habitats and monitor populations of raptors at risk. Information collected provides a measure of the state of the habitat in relation to raptor populations that helps identify needed conservation actions. Throughout this work, we have increased our knowledge about data deficient species, and created opportunities for hands-on raptor research, education, and training of students and others who develop skills in research and enthusiasm for conservation.

Tony Crocetta

African Fish Eagle.

RESULTS

Rift Valley Lakes—Lakes Naivasha and Baringo are the only freshwater lakes in Kenya's Rift Valley. For the past decade we have focused on the African Fish Eagle as an indicator of the health of these lakes. At Lake Naivasha, exponential horticultural expansion, uncontrolled lake water abstraction, alien species introductions, and a huge influx of humans, in excess of 25,000, working on the flower farms threaten the remaining 36 pairs of African Fish Eagles. This population has already declined by over 50% since the mid-1970s. At Lake Baringo, a heavy silt load due to shoreline deforestation and erosion from the catchments is causing the lake to become shallower and more turbid, threatening the survival of the resident 15 pairs of eagles.

Masai Mara National Reserve—This World Heritage Site is Kenya's most threatened Important Bird Area. Conversion of wildlife areas into large-scale wheat farms, unchecked tourism expansion, and a growing Masai population have changed the Mara landscape with obvious impacts on biodiversity. Since July 2003, we have conducted quarterly raptor surveys to understand factors affecting the temporal and spatial abundance of raptors along a gradient of different land uses. Our results show that numbers of scavenging birds are correlated with numbers of large migratory ungulates. With help from local expert Paul Kirui, we have located and monitored nests of African White-backed, White-headed, Hooded, and Lappet-faced Vultures for further study. We organized a successful vulture workshop in the Mara to create awareness about the role of vultures, identify threats to raptors, and obtain support from local Masai communities to help ensure raptor conservation. A resolution was adopted by participants to conduct further detailed studies and incorporate results into an overall management plan. We published and distributed a report entitled "Vulture Conservation in the Masai Mara National Reserve" among participants and stake holders.

Kwenia—The spectacular cliffs that line this temporary lake south of Nairobi support the largest known colony of Rüppell's Vultures in southern Kenya. A fourth consecutive year of monitoring showed that the Rüppell's Vulture population appears healthy and ranges from 180 to 250 individuals with a maximum of 39 active nests recorded. We conducted an aerial survey and located additional "satellite" vulture colonies in adjacent areas that were inaccessible by road. In April we brought members of Nature Kenya's bird

Munir Virani

Flamingos are among the main prey of African Fish Eagles on some lakes.

Below: Simon Thomsett with a Bale Mountain Golden Eagle.

Simon Thomsett

committee to see the site as the first step to raise the area's conservation profile. Currently, Kwenia has no protected or conservation status.

Pemba Island—Located 50 km off the East African coast, the spice island of Pemba is classified as one of 218 Endemic Bird Areas of the world having a relatively high number of endemic (found nowhere else in the world) species. The status of all raptors on Pemba is poorly known, and no conservation attention has been given to the endemic Pemba Scops Owl and the Pemba race of the African Goshawk. Extensive human use of the island may have serious consequences for the owl population as well as other raptors. Although the Pemba Scops Owl is locally considered "common," our survey this year found this claim to be incorrect in all habitats other than indigenous forest. We found that the owls occur mainly in Ngezi Forest and Msitu Mkuu, two tiny patches of remnant forests that, inclusive of all others, make up less than 2% of the island. The owls occur at significantly lower densities in clove and mango plantations. The collapse in global prices of cloves has caused many farmers to clear long-established clove forests for more lucrative crops such as rice and cassava, both of which are impossible habitats for the owls. The conversion of areas that were formerly clove plantations is a serious threat to the long-term survival of this species. There is a clear need to understand the species' ecology and re-evaluate its conservation status before it becomes too late.

Education, Training, and Awareness—The Athi River Raptor Facility continues to be regularly visited by school groups and individuals. For the first time ever, two of the five captive-bred Crowned Eagles released in Tsavo West produced a chick that was unfortunately devoured by baboons. The publicity gained from the Crowned Eagle releases has ignited public enthusiasm for conservation of forest raptors and their habitat. Simon Thomsett initiated restoration and modernization of National Museum raptor exhibits by donating artwork and mounted specimens. We conducted two raptor identification courses and made a video that highlighted one of Africa's largest vulture poisoning incidents which killed 186 birds in April 2004. We provided support to Darcy Ogada, a Ph.D. candidate who is conducting a study on the little-known Mackinder's Eagle Owl at Mweiga in Central Kenya. Darcy's study aims to identify factors that affect the high owl population density at Mweiga despite the pressures of an increasing human population and a negative local perception of owls in general. Simon Thomsett was presented with an Environmental Leadership Award from the Eastern African Environmental Network in recognition of his outstanding contribution to raptor conservation.

FUTURE PLANS

We will continue monitoring populations of African Fish Eagles and Rüppell's Vultures as indices of the ecological health of Rift Valley lakes and Kwenia, respectively. We have expanded our fish eagle work by providing support to Nature Uganda and Makerere University Institute of Environment and Natural Resources to collect data at Kazinga Channel and other Rift Valley lakes in Uganda. We will publish our data on raptor abundance and diversity, and continue to support Paul Kirui to locate and monitor vulture nests in the Mara. We plan to conduct banding, satellite, and radio-tracking studies on vultures in the Mara to understand their foraging patterns and to stimulate public interest in raptor biology and conservation. Additional studies will be started to improve our understanding of the Pemba Scops Owl and other raptors on Pemba Island. Raptor biology training courses have been planned for visiting international students. In Kenya's National Parks we will continue to develop and maintain raptor observation blinds and improve safety of water reservoirs to prevent raptor drowning. ■

STAFF

The East Africa Project is conducted by Simon Thomsett and Munir Virani.

COOPERATORS

We collaborate with the Department of Ornithology at the National Museums of Kenya, Kenya Wildlife Service, Game Ranching Limited Athi River, Hell's Gate Management Committee, University of Leicester (United Kingdom), Lake Naivasha Riparian Association, A Rocha, Nature Kenya, Heritage Hotels, Narok County Council, County Councils of Baringo and Koibatek, Nature Uganda, Makerere University Instutute of Environment and Natural Resources (Uganda), Department of Environment (Ministry of Agriculture, Natural Resources, Environment and Cooperatives) Zanzibar, and Department of Commercial Crops, Fruits and Forestry (Pemba).

Financial support for this project was provided by an important anonymous donor.

Madagascar Project

Goal

Prevent the extinction of endangered raptors, assist in the conservation of essential habitat, and develop local capacity for conservation using Madagascar's rare and endangered birds of prey as a focus.

Isolated from the African continent for around 150 million years, Madagascar has evolved into a unique naturalist paradise. It is the fourth largest island in the world, harbors endemic species that exist nowhere else, and is one of the world's most important biodiversity conservation "hot-spots." Twenty-four raptor species occur in Madagascar, 13 are endemic to this large island, and three are classified as endangered. Of the latter, the Madagascar Serpent-Eagle and Madagascar Red Owl were thought by some to be extinct until we rediscovered them in remaining patches of eastern rainforest. The Madagascar Fish Eagle occurs in very low numbers on western offshore islands and mangroves, and inland along rivers and lakes.

The Peregrine Fund began work in Madagascar in 1990 to help conserve endangered birds of prey and their valuable habitat. We helped create Madagascar's largest national park to protect 210,000 ha of rainforest for the Madagascar Serpent-Eagle, Madagascar Red Owl, and species unique to Masoala Peninsula. We pioneered community-based conservation to protect critical wetland habitat shared by Madagascar Fish Eagles and local Sakalava fishermen. We continue to provide important information, training, and assistance to other conservation projects, and develop local capacity for conservation through local personnel and student training, education, and support. We have supported 13 Malagasy students at M.Sc. and Ph.D. levels, three students from the U.S. and England at M.Sc. and Ph.D. levels, trained 20 local people as field technicians, and involved others as staff, volunteers, and visiting students. Many of these have completed and published studies on Malagasy raptors and other birds, fisheries, lemur ecology, and ethnobotany. This core group of educated and trained Malagasy personnel will help conservation continue in perpetuity.

RESULTS

Lily-Arison René de Roland became the new National Director for The Peregrine Fund's Madagascar Project. Lily has been with the project since The Peregrine Fund first began work in Madagascar as a former M.Sc. and Ph.D. student, and then employee.

The Madagascar Project has two major project sites. One is in the western central part of the country where the Madagascar Fish Eagle and Wetlands Conservation Project is based around several lakes. We continued to support two local associations (FIZAMI and FIFAMA) to manage natural resources in the Manambolomaty Lakes Complex and surrounding forests. These associations, created by The Peregrine Fund's community conservation project, enforce conservation rules and policies established inside wetland management zones. The associations were among five groups in Madagascar to receive the "Gift to the Earth Award," WWF's highest award for globally significant conservation achievement. In addition, an independent evaluator, commissioned by one of our financial supporters, the Liz Claiborne and Art Ortenberg Foundation, gave our project and the two associations an exceptional commendation for conservation accomplishments in this region. We continue to provide logistical, material, and financial support and training to the associations and local authorities.

At our Madagascar Fish Eagle study site in the Manambolomaty Lakes Complex, 11 pairs of fish eagles were recorded, 10 attempted to nest, and eight young fledged. We also monitored 16 fish eagle nesting attempts outside of this area which fledged seven young. A geographic information system (GIS) project was completed this year using satellite imagery to identify water and forest habitat suitable for Madagascar Fish Eagles throughout western Madagascar. The model created detailed maps of potential fish eagle habitat that will be used to direct a population census in 2005 and predict the species' maximum possible population size.

Our second major project is located in the lowland rainforests of Masoala Peninsula, north-eastern Madagascar. This roadless region is one of the largest blocks of intact lowland rainforest remaining in Madagascar. It was here in 1993 that

Lily-Arison Rene de Roland

Lily-Arison Rene de Roland

Above: Torotoroka Scops Owl, a newly-described species of Scops owl.

Juliot Ramamonjisoa (left), an M.Sc. degree student, records information from a newly-captured Torotoroka Scops Owl in western Madagascar with the help of Peregrine Fund technician Gaston Rakotondraoelina.

Lily-Arison Rene de Roland

Russell Thorstrom

Above: Peregrine Fund technicians number fishermen's dugout canoes to assist community associations with fishing control.

Adult male Madagascar Fish Eagle.

we rediscovered the serpent eagle and red owl, and in 1997 helped create Madagascar's largest rainforest reserve. Working from Andranobe field station on the west side of the peninsula, we have continued to gather natural history and ecological information on endangered and poorly-known raptors and assist conservation.

Lily-Arison completed surveys in January and February for Madagascar Serpent-Eagles in Ambatovaky and Marotandrano National Parks, finding the species in both locations. It appears that serpent-eagles are present in the largest remaining forest fragments but occur at low density and prefer the most threatened low- to mid-altitude forests up to 1,000 m elevation. We have recorded them from central Madagascar northwards along a 500 km chain of eastern forest blocks and fragments.

Malagasy Masters student Tolojanahary Andriamalala finished his thesis on the breeding ecology of the Yellow-billed Kite in western Madagascar where he studied 20 nesting attempts that successfully fledged 10 young. Their diet was predominantly fish and fish carcasses. Malagasy M.Sc. student Juliot Ramamonjisoa finished his second field season studying the ecology of the recently described Torotoroka Scops Owl based from our fish eagle camp in western Madagascar. In two years he located eight nests that fledged three young. Their diet consisted of insects and geckos.

First year Malagasy M.Sc. student Donatien Randrianjafiniasa completed his first field season studying the Madagascar Cuckoo-Hawk at Ambatovaky Reserve in northeastern Madagascar. He observed one nesting pair which successfully fledged two young. Their diet consisted of frogs, insects, and lizards.

We published two papers on the ecology of the Madagascar Harrier, a study conducted by one of our M.Sc. students, and published a first nest description of the Madagascar Flufftail. Another former Malagasy student enrolled in a doctorate program at Harvard University and published a paper on the ecology of the Scaly Ground-roller from his M.Sc. degree study. Lily-Arison taught a one-week course on bird ecology at the University of Tulear. British doctoral student Ruth Tingay published a short note on the survivability of a one-legged fish eagle.

FUTURE PLANS

We will continue to (1) assist the two wetland management associations during their 10-year probation period so they can successfully manage the natural resources that they share with Madagascar Fish Eagles, (2) study the Madagascar Serpent-Eagles in Masoala region and survey for them in remote areas to determine their distribution and status throughout the eastern rainforests of Madagascar, (3) provide study opportunities for new Malagasy students, assist them in their educational experience, and help them publish research on raptors, and (4) continue publishing results and disseminating information through publications, conferences, and meetings. ■

STAFF

Russell Thorstrom manages the Madagascar Project with Lily-Arison Rene de Roland, Jeanneney Rabearivony, Marius Rakotondratsima, Jeanette Ravaoarisoa, and a staff of 22 in Madagascar (see staff list on inside cover for full listing). Valuable assistance was provided by volunteers Nick Unwin and Julien Charmont.

COOPERATORS

We collaborate with the Ministére des Eaux et Forêts (MEF/DEF), Minstére de l'Enseignement Supérier (MinSup), and Ministére de la Recherche Appliquée au Dévelopment (MRAD), Association pour la Gestion des Aires Protégées (ANGAP), Organization National pour l'Environment (ONE), University of Antananarivo, United Nations Eductional, Scientific and Cultural Organization (UNESCO), Parc Botanique et Zoologique de Tsimbazaza, World Wide Fund for Nature (WWF-Madagascar), Wildlife Conservation Society, Conservation International, Ranomafana National Park, Projét Masoala, Madagascar Faunal Group, Durrell Wildlife Conservation Institute, and many others. Amy Haak and Matt Mayfield of Spatial Dynamics/Conservation Geography provided valuable time and expertise to the fish eagle habitat modeling project.

Financial support for this project was provided by the Critical Ecosystem Partnership Fund, Conservation International-Madagascar, Liz Claiborne and Art Ortenberg Foundation, Little Family Foundation, and several important individuals. The Critical Ecosystem Partnership Fund is a joint initiative of Conservation International, the Global Environment Facility, the Government of Japan, the MacArthur Foundation, and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

ASIA-PACIFIC RAPTOR CONSERVATION PROGRAM

Goal

Conserve species in jeopardy through research, hands-on intervention, and development of local capacity.

The Asia-Pacific Raptor Conservation Program focuses on raptor species that occur in the Oriental and parts of the Australasian biogeographic regions and that are in jeopardy or too poorly known to estimate their conservation status. Until recently, the most threatened species occurred on the islands between the Pacific and Indian Oceans, but catastrophic declines in *Gyps* vulture populations in South Asia (Indian sub-continent) have resulted in three species being listed as *critically endangered,* accounting for half of all raptors worldwide listed in this most precarious state. The Asian Vulture Crisis Project is described separately in the following pages.

RESULTS

New Guinea Harpy Eagle Project—The New Guinea Harpy Eagle (NGHE) is one of the least known of the large eagles in the world. Despite its large size, neither its basic biology nor its population status is known. From an ecological standpoint, this species is similar to the four other crowned forest eagles which we are studying—the Crested and Harpy Eagles of the Neotropics, the African Crowned Eagle, and the Philippine Eagle. A detailed study of the New Guinea species will clarify its conservation status, generate ecological information of comparative interest to the other species, and promote local conservation capacity in Papua New Guinea.

After New Guinea field assistants Smith Asoyama and Amos Hatwara located six NGHE nests from 10 pairs in various stages of the breeding cycle in 2003, cooperator Andrew Mack identified New Guinea student Leo Legra to conduct further study with our supervision and support. Leo began work in October 2003 studying the nest-site selection and behavior of the NGHE. The first part of his study was based on behavioral observations of four fledglings from separate nests around Herowana village in the Crater Mountain Wildlife Management Area. He followed each fledgling daily for two weeks, collecting information on behavior, calls, flight, feeding, and foraging attempts. Prey for the juvenile was left by parents on horizontal tree branches or branches with forks. Prey remains were collected and identi-

Martin Gilbert

Above: Fledgling New Guinea Harpy Eagle.

Bill Burnham

A Mongolian falconer hunts with a Golden Eagle as his ancestors have done since before recorded history.

Photo courtesy of Neil Rettig Productions, Inc.

Philippine Eagle with young.

fied to species level. Hunting behavior by fledglings was observed but no attempts were successful. When behavioral observations were made, various parameters of the trees where the juveniles roosted were measured and these were then associated with the particular behavior of the juvenile at that particular tree. Six nest sites were visited to collect data on nest site selection. This involved measuring variables related to the nest tree, micro-habitat, and landscape to understand why the NGHE selects certain habitats and not others. Since some of the nest trees were near villages, the presence and number of gardens also had to be measured. Leo Legra's field work continues.

Mongolia Project—Since beginning in 1999 this project has improved Mongolia's response to raptor conservation by training a Mongolian biologist in raptor biology who now works with local conservation and science organizations such as World Wildlife Fund-Mongolia and the Mongolian Academy of Science. The thesis research conducted by Mongolian biologist Nyambayar Batbayar (Nyamba) as part of his M.Sc. degree has provided new information about the ecology of the Cinereous Vulture and other raptors. In 2004 Nyamba graduated with his M.Sc. degree in Raptor Biology from Boise State University. Nyamba's study found that Cinereous Vultures were food limited in Mongolia, and dependent on domestic livestock carcasses left by nomadic herders. Mongolia may support the largest remaining breeding population of this species, which is endangered in Europe and other parts of its range. The global status of the species is therefore vulnerable to changes that are occurring in Mongolia as the traditionally nomadic herding lifestyle is replaced with modern sedentary occupations. Based on recent reports, Cinereous Vultures may also be vulnerable to West Nile Virus, and are potentially vulnerable to carcass contamination from the drug diclofenac that has decimated *Gyps* vulture populations in South Asia.

Philippine Eagle Project—We annually assist the Philippine Eagle Foundation by providing technical advice and financial support. In addition, in 2004 we provided a satellite-monitored transmitter and monitoring for their first release by hacking of a Philippine Eagle. This is a dedicated group of highly motivated people who each year produce meaningful results for conservation of the Philippine Eagle and raptors in the Philippines. For further information about the organization and their accomplishments write to the Philippine Eagle Foundation, VAL Learning Village, Ruby Street, Marfori Heights, Davao City 8000, Philippines, or e-mail at *info@philippineeagle.org* and visit their web site at *www.philippineeagle.org*.

FUTURE PLANS

In Papua New Guinea we will continue to provide student support, training, and guidance in the study of breeding behavior and ecology of New Guinea Harpy Eagles and continue supporting local guides to help locate active nests. With assistance from geneticist Jeff Johnson we will compare the genetic relationship of the New Guinea Harpy Eagle with other large forest crowned eagles using molecular genetics techniques.

In Mongolia we look forward to the publication of Nyamba's research on Cinereous Vultures. As funding permits, we will consider sending a biologist/falconer to study falconry with Golden Eagles in Mongolia; a major aim of this activity would be to publish a book on the subject to help preserve the knowledge about eagles gained from this tradition.

We plan to continue assisting the Philippine Eagle Foundation. ■

STAFF

Rick Watson directs this program.

COOPERATORS

In Papua New Guinea we collaborate with the Research and Conservation Foundation of Papua New Guinea, Wildlife Conservation Society, Andrew Mack and Debra Wright, and the people of the Crater Mountain Wildlife Management Area.

The Mongolia Project was supported with grants from the Trust for Mutual Understanding. Important guidance was provided by Mark Fuller, USGS Snake River Field Station and Raptor Research Center, Boise State University.

In the Philippines, we collaborate with the Philippine Eagle Foundation and Jim and Joyce Grier. Important assistance was provided by Lucia Severinghaus, a member of The Peregrine Fund Board of Directors. Bill Burnham serves as a trustee on the Philippine Eagle Foundation Board of Trustees.

Goal

Help prevent the extinction of three species of *Gyps* vultures in South Asia.

Munir Virani

Muhammad Asim, Pakistan Project Manager, at the "vulture restaurant."

Pat Benson

In the 16th century town of Orchha, vultures roost atop a majestic temple that was gifted to Emperor Jahnagir of the Mughal Dynasty.

Three species of *Gyps* vultures (Oriental White-backed, Long-billed, and Slender-billed) occurring in South Asia have been listed as *critically endangered* following a catastrophic crash in their populations to less than 5% since the early 1990s. The Peregrine Fund's research was the first to identify the cause of the vulture decline which we showed was due to poisoning by the veterinary drug diclofenac. After consuming livestock carcasses contaminated with diclofenac, vultures developed kidney failure and visceral gout and died within a few days. Our work has been verified by other studies that also demonstrate that it takes less than one contaminated carcass out of 130 to cause the magnitude of decline observed over the last decade.

Having discovered the primary cause of the vulture decline, we have a very short period of time in which to save these birds from extinction. Our greatest challenge is in convincing the governments of South Asia to remove diclofenac from the environment and to assist with vulture restoration efforts involving captive breeding of vultures. This is a challenging task because even though vultures play important ecological, economic, traditional, and aesthetic roles in the region, they are not perceived in the same light as charismatic and income-generating fauna like tigers and rhinos.

RESULTS

In the months since discovering the lethal effect of diclofenac on South Asian *Gyps* vultures, we have accomplished four major goals that have been instrumental in starting remedial actions to save vultures from extinction. First, the scientific evidence demonstrating that diclofenac is responsible for the catastrophic decline in vultures across South Asia was peer reviewed and published in the prestigious journal *Nature.* We presented this evidence at the Kathmandu Summit Meeting in February 2004 to senior representatives of governments from the region, where they publicly acknowledged their responsibility for controlling the veterinary use of diclofenac and supporting efforts to restore vulture species to viable populations. We established that contaminated carcasses

occur at sufficient spatial and temporal frequency across South Asia to cause vulture population declines in the order of 30% per year, leading to the extinction of at least two *Gyps* species in the very near future. We published a feasibility report on controlling diclofenac and identifying alternative strategies for removing the drug from the environment. We proposed options for the recovery of vultures that are being pursued by national governments and major international non-governmental organizations active in the region.

The direct results and synergistic effects of our effort have been far greater than we dared hope. We have effectively presented sound, scientific information to the right organizations and individuals in a logical, rational manner. The result is a growing wave of effort by other organizations and individuals towards vulture conservation that we could never have achieved on our own. This work has been very successful and could reasonably be considered another key strategic accomplishment in the task of preventing vulture extinctions in South Asia.

A key element in driving the vulture restoration process will be to accurately establish numbers and locations of remaining vulture populations across South Asia's vast region. To achieve this objective, we launched the Asian Vulture Population Project (AVPP) which uses the internet to recruit volunteer observers across South Asia to provide data on numbers of active nests at vulture breeding colonies. Results are regularly posted on our website *(http://www.peregrinefund.org/vulture/)* and allow researchers to share their findings and maintain an up-to-date record of the status of Asian *Gyps* vultures. By January 2005, 27 individuals and organizations had contributed data from over 100 sites.

We continued to monitor remaining vulture colonies in Pakistan and contributed the data to the AVPP. At the start of the 2004/05 breeding season, only two breeding colonies of Oriental White-backed Vultures remained in Pakistan: Toawala (121 occupied nests) and Rangpur (72 occupied nests). This is in contrast to when we began our work in 2000 when we located over 2,400 breeding pairs in Pakistan. Since then, we have found and removed nearly 1,800 dead vultures from our study sites. Although Toawala and Rangpur are presently the largest known remaining breeding colonies of this species in South Asia, they have undergone a staggering population collapse of 90% in just four years. This unprecedented rate of decline means that without remedial action very soon, we could be monitoring these birds to extinction. We are also observing the largest known breeding colony of Long-billed Vultures located in Nagar Parkar, a remote site in southeast Pakistan where 247 occupied nests were recorded in January 2004.

Pat Benson

Flying Asian Vulture.

In India, we collected breeding data on remnant vulture populations for a third breeding season at Ranthambhore, Bandhavgarh, and Kanha National Parks. Vulture numbers again declined at all sites with Oriental White-backed Vultures more severely affected than Long-billed Vultures.

In Pakistan, we maintain the only vulture feeding station in South Asia near Toawala colony where we feed vultures daily on diclofenac-free food. We have found that this method of in-situ conservation can significantly reduce vulture mortality during the breeding season when vultures are tied to nest sites, but is less effective when vultures are not breeding, disperse from their nest areas, and become vulnerable to contaminated food. Our aim is to sustain vultures in the wild at least long enough for captive breeding restoration to be established and veterinary diclofenac banned.

During 2004 we participated in filming a documentary about the Asian vulture population crash and our discovery of the cause. The documentary, *Last Flight,* won the Wild Wing Conservation Award 2004 and contributed importantly to the decision, announced 17 March 2005, by India's Prime Minister Manmohan Singh to phase out veterinary diclofenac within six months to safeguard wild populations of vultures.

FUTURE WORK

Despite our success, we believe there is a need to sustain our work in South Asia to help establish vulture conservation and restoration efforts with a high probability of success. Our future work in South Asia has three aims. First, we will provide expertise, guidance, and training in species restoration, especially to WWF-Pakistan and their partners. Second, we will continue to help conserve wild populations of Oriental White-backed Vultures by reducing diclofenac-caused mortalities. This will be done by providing vultures with clean food at the largest known remaining colony at Toawala, Pakistan, at least until sufficient vultures have been collected for a captive breeding program. Finally, we will continue to evaluate conservation results by recording and quantifying vulture populations throughout the Indian sub-continent through field surveys and by encouraging contributions to the Asian Vulture Population Project web site. We will contribute data by counting vultures and measuring breeding and mortality at the two largest known remaining breeding colonies of Oriental White-backed and Long-billed Vultures at Toawala and Nagar Parkar, respectively. ■

STAFF

This project is directed by Rick Watson and conducted by Munir Virani and Muhammad Asim. The AVPP web site is maintained by Cameron Ellis. Martin Gilbert and J. Lindsay Oaks made important contributions during 2004. Field assistance was provided by Shakeel Ahmed, Muhammad Jamshed Iqbal Chaudhry, Muhammad Arshad, Shahid Mahmood, Ahmad Ali, Patrick Benson, and Faisal Farid. Genetic research is accomplished by Jeff Johnson and David Mindell of the University of Michigan.

COOPERATORS

We work in partnership with the Ornithological Society of Pakistan, World Wide Fund for Nature (Pakistan), Punjab Wildlife Department, Bird Conservation Nepal, Environmental Research and Wildlife Development Agency, The Royal Society for the Protection of Birds, Environmental Research and Wildlife Development Agency, Abu Dhabi, and Bombay Natural History Society. Also assisting the project was John Turner, Assistant Secretary of the U.S. State Department.

Important financial support was provided by the Gordon and Betty Moore Foundation, Royal Society for the Protection of Birds, and Disney Wildlife Conservation Fund.

The Peregrine Fund is a not-for-profit organization and can only operate through the support of voluntary contributions. Because no work could have been done without this financial support, the birds truly are in your hands. We are proud to list the individuals, businesses, organizations, foundations, and agencies who have contributed $100 or more, including gifts of goods or services, during 2004. We regret that space limits us to listing only those who have contributed at that level and above. Every donor is very important to us, and your continuing participation makes the programs possible. We thank each and every one of you for your partnership.

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We hope you will consider The Peregrine Fund in your estate planning. Memorial gifts and bequests are placed in our endowment fund so that these gifts can permanently support the conservation of birds and their environments. We welcome inquiries about bequests at (208) 362-3716.

If you wish to make a provision in your will, the following general form is suggested:

I give, devise, and bequeath to The Peregrine Fund, Inc., an Idaho not-for-profit corporation, located on the date hereof at the World Center for Birds of Prey, 5668 West Flying Hawk Lane, Boise, Idaho 83709, the sum of $_____ (or specifically described property)."

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The Peregrine Fund depends on contributions to fund our projects. Our Board of Directors has created an endowment, the interest from which funds our administrative expenses so that 100% of your donation will be applied directly to our projects. You can make a contribution through a direct gift, at workplace giving campaigns, or through planned giving. The Peregrine Fund participates in many payroll deduction campaigns, including the Combined Federal Campaign (CFC #0945) through Earth Share, an alliance of national and environmental charities and state environmental federations. You may also increase or even double your contribution to The Peregrine Fund by participating in your employer's matching gift program. Ask your employer how you can participate. To donate directly to The Peregrine Fund, please use the envelope inside this annual report or join via our web site at www.peregrinefund.org.

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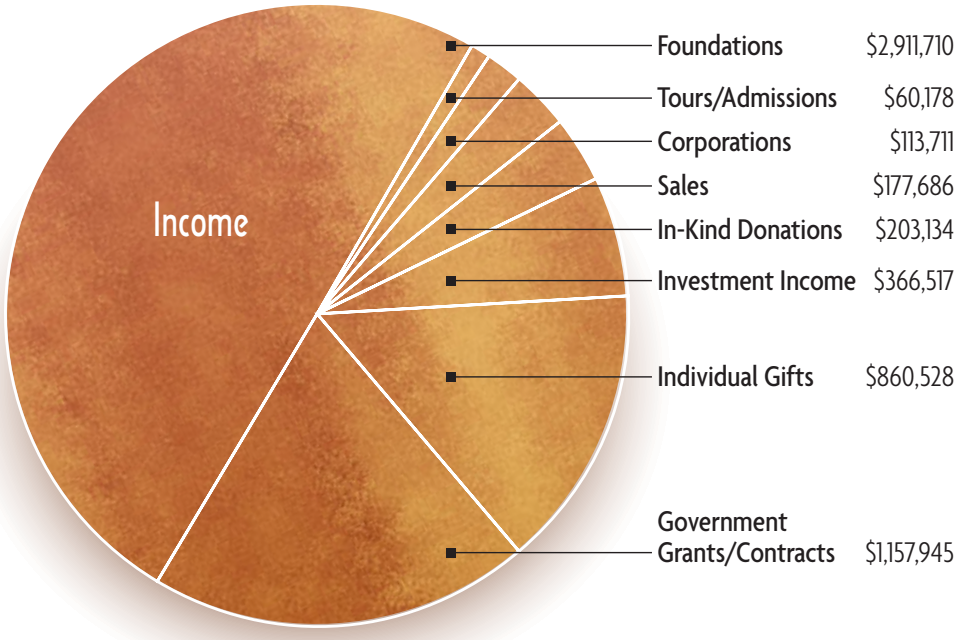
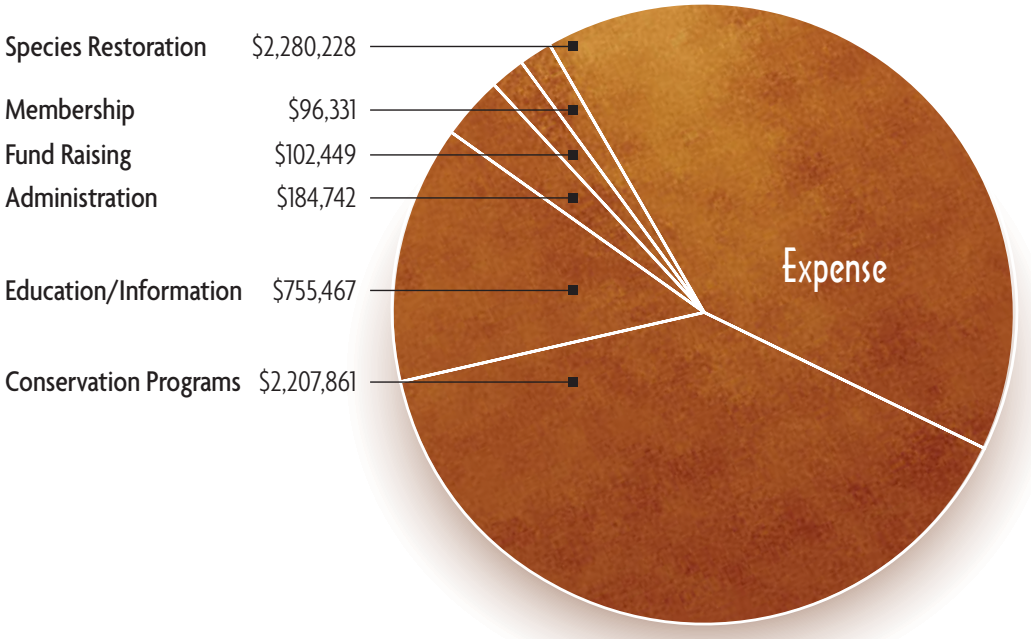
Balance Sheets ▸ 30 September 2004 and 2003

ASSETS	2004	2003
CURRENT ASSETS		
Cash and cash equivalents	$ 1,056,578	$ 973,892
Merchandise inventory	32,094	34,056
Grants receivable	79,750	144,430
Pledges and other accounts receivable	24,821	39,976
Prepaids and other current assets	21,030	49,250
TOTAL CURRENT ASSETS	1,214,273	1,241,604
PROPERTY, EQUIPMENT, AND ARCHIVES		
Land	1,513,000	1,513,000
Land improvements	686,545	680,545
Buildings	4,160,061	4,177,296
Trailers	222,396	222,396
Equipment and vehicles	896,965	818,644
Fixtures and displays	640,081	640,081
Construction in progress	0	0
	8,119,048	8,051,962
Accumulated depreciation	(2,988,122)	(2,696,282)
	5,130,926	5,355,680
Library	59,160	59,160
Archives	741,251	687,652
	5,931,337	6,102,492
ENDOWMENT ASSETS		
Cash	15,949	23,732
Investments	8,304,424	7,545,897
	8,320,373	7,569,629
	15,465,983	$ 14,913,725

LIABILITIES & FUND BALANCES	2004	2003
CURRENT LIABILITIES		
Accounts payable	$ 150,169	194,802
Accrued taxes and expenses	9,933	3,517
Deferred restricted revenue	104,746	93,027
TOTAL CURRENT LIABILITIES	264,848	291,346
FUND BALANCES		
Unrestricted operating fund	949,425	950,258
Restricted endowment fund	8,320,373	7,569,629
Investment in property, equipment and archives	5,931,337	6,102,492
TOTAL FUND BALANCES	15,201,135	14,622,379
	15,465,983	$ 14,913,725





Many organizations and individuals contribute materials at no cost or at cost. Services contributed have been recorded at the amount it would have cost The Peregrine Fund.

Figures for this audited statement were provided by Balukoff, Lindstrom & Co., P.A., Certified Public Accountants. Full reports are available upon request.

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"By the Cliff — Red-tailed Hawk" © Robert Bateman • Courtesy of the artist and Mill Pond Press, Inc. Venice, Florida 34285

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