THE PEREGRINE FUND

WORLD CENTER FOR BIRDS OF PREY

· 2002 ANNUAL REPORT ·

Working to Conserve Birds of Prey in Nature

Erin Gott

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W. Perry Conway

Jack Cafferty

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Letter from the President

Jeff Cilek

Paxson Offield, Chairman of the Board, with his daughter Kelsey.

Since its founding in 1970, The Peregrine Fund had six Chairmen of the Board prior to the fall 2002 Board of Directors meeting when Paxson H. Offield was elected into that role. Tom J. Cade is, of course, the Founding Chairman as well as the founder of the organization. Following Tom as Chairman of the Board of Directors were Roy E. Disney (1990-92), Gerald D. Herrick (1992-94), Julie A. Wrigley (1994-96), Henry M. Paulson, Jr. (1996-2000), and D. James Nelson (2000-02). The organization has been extremely fortunate to have had such a capable and prestigious group of chairmen, each of whom has left his or her own personal signature on the organization and contributed to our long list of accomplishments. Mr. Offield is yet another very accomplished, dedicated, and caring person to join this elite group.

The standards and expectations for each board member, and the Board of Directors as a functioning body, are high, just as they are for the staff and annual operation and achievements of the organization. Board members are elected for four-year terms with a maximum of two terms followed by at least one year off the Board. There is no compensation paid to Board members for their participation; instead each member is expected to contribute financially each year. Current Board members are from the United States, Panama, Great Britain, and Taiwan. Each has been carefully selected based on his or her personal abilities and knowledge. Their backgrounds are diverse, as are their national and international perspectives. Weekly interactions between Board members and staff occur. Beyond Board committee conference calls, there are two full board meetings annually that are typically held where projects occur, including international locations, so Board members can see projects first hand and better evaluate what is being attempted and accomplished.

Over the past months there have been serious questions raised about corporate boards and their fulfilling the proper strategic, oversight, and fiduciary roles for shareholders. The importance of non-profit boards is no less important and possibly of even greater importance to the potential success or failure of organizations. Stock is not sold for non-profits and there are no shareholders per se, but just the same we also do have investors. They are the annual contributors to The Peregrine Fund. Every donation, regardless of amount, is an investment provided with the belief it will produce a return in the form of results. The Peregrine Fund Board and staff take this responsibility very seriously. Particularly during these difficult financial times, focus, planning, and careful and effective execution of action are even more important to producing maximum results from dollars invested. There is no margin for error.

We proudly present this annual report summarizing our achievements.

Sincerely,

Bill Burnham
President

Northern Aplomado Falcon Restoration

GOAL

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

J. Peter Jenny

The Northern Aplomado Falcon once nested within a broad swath across the southwestern United States, but disappeared from this portion of its range by the mid-20th century from causes that are still poorly understood. The Peregrine Fund is working toward the recovery of the Northern Aplomado Falcon.

To accomplish this, we developed a captive breeding flock with 25 nestlings collected in Veracruz, Tabasco, Campeche, and Chiapas, Mexico. The propagation of this species remains challenging, highly technical, and labor intensive, with much of the production the result of artificial insemination. Despite these challenges, a total of 812 captive-bred falcons have been released in Texas, resulting in the formation of at least 37 adult and subadult pairs, where prior to 1995 there were none. Moreover, these pairs are now beginning to breed, and have successfully fledged more than 87 young. Releases have occurred 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. For the Aplomado Falcon, "historical" habitat and "suitable" habitat may be very different in highly modified contemporary landscapes. The falcons are being released under a "Safe Harbor" designation of the Endangered Species Act, and more than 1.5 million acres are enrolled in the program.

We are working toward the recovery of the Northern Aplomado Falcon by establishing two populations, each with several subpopulations determined by the spatial arrangement of suitable areas of falcon habitat. One is a coastal population occupying habitats from Matagorda Island National Wildlife Refuge south along the Texas coast and down into the Mexican state of Tamaulipas. Currently this reintroduced population consists of two known subpopulations, one on Matagorda Island and the other centered around Laguna Atascosa National Wildlife Refuge, including one known pair across the border in Mexico. Our expectation is to enlarge the distribution and size of this population to the degree possible in coastal Texas, but also southward into Mexico, until there are at least 50 nesting pairs (territories). Similarly, we would like to see at least 50 nesting pairs in the Chihuahuan desert region of Mexico and the U.S. (southeastern Arizona, southwestern New Mexico, western Texas). Currently there are two known, naturally occurring subpopulations in northern Chihuahua—approximately five to 10 pairs at Tinaja Verde and 20 to 25 pairs at El Sueco, plus a few scattered pairs northward toward the U.S. border. When the two populations each exceed 50 breeding pairs, and in consideration of the substantial known populations to the south in subtropical Mexico, we believe delisting of the subspecies should occur.

2002 RESULTS

During the spring and summer of 2002, we produced 121 young from 32 captive pairs of Aplomado Falcons in Boise. Ten young were held back to augment the captive breeding population, now totaling 46 pairs. We released 110 young falcons by hacking at seven sites along the Texas Gulf Coast, and at two sites in West Texas. Our biologists consider a falcon to be successfully released when it has become independent of our care, a process usually taking three to six weeks. The rate of success for releases has averaged 66% during the last five years. Sources of predation include the raccoon, coyote, Crested Caracara, and Great Horned Owl. This year the success rate was 68%. We began releases for the first time in West Texas by hacking 35 falcons on two private ranches near Valentine. Although Great Horned Owls contributed to some losses, at least 25 young (71%) reached independence.

This year biologists located some 36 pairs of Aplomado Falcons in South Texas, and for the first time, we found a pair in adjacent Tamaulipas, Mexico. We have always suspected that falcons released in South Texas were moving south across the border to colonize suitable habitat in Mexico, but this is the first solid proof that this is actually taking place. Twenty-seven pairs (73%) attempted to breed, successfully fledging 32 young. Nests were located on a variety of structures, both manmade and natural, including such novel structures as microwave towers. We received assistance again this year from American Electric Power Company whose power poles provide excellent nest sites for the falcons, and with their help we were able to band young and erect artificial nesting structures. Two core breeding areas have developed as a result of our release efforts. We are observing 13 pairs on and around Matagorda Island National Wildlife Refuge, and a second group of 24 pairs approximately 150 miles to the south on and around Laguna Atascosa National Wildlife Refuge and just across the U.S./Mexico border in coastal Tamaulipas. Predation was significant, as in previous years, with more than half of the breeding pairs experiencing nest predation. One pair that failed in an attempt to nest on the ground was able to nest a second time successfully when our biologists provided an artificial nest structure.

© W.S. Clark

We have always suspected that falcons released in South Texas were moving south across the border to colonize suitable habitat in Mexico, but this is the first solid proof that this is actually taking place.

Staff-Program Direction, Peter Jenny; Coordination, Bill Heinrich; Captive Breeding, Cal Sandfort; Senior Scientist, Grainger Hunt; Field Biologists: Brian Mutch, Angel Montoya, Erin Gott, Jessi Brown, Marta Curti, and Alberto Macias; Veterinary Support, Bruce Rideout; Hack Site Attendants: Ken Jessen, Paul Mueller, Chris Gordon, Ben Rogers, Sara Carine, Emma Christensen, Chasidy Yu, Phaedra Demers, Anna Welch, Jessie Loerch, Megan Martz, Jennifer Reidy, Chris Buelow, Jenna Garvey. Emily Swim, and Jennifer Peterson; Field Technicians, Mexico: Julio César Gallardo Del Angel and José Roberto Rodriguez Salazar.

Cooperators-We cooperate with the U.S. Fish and Wildlife Service (USFWS), the Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT), PROFAUNA, the Texas Parks and Wildlife Department, T and E., Inc., and Alberto Lafon Terrazas of the Universidad Autonoma de Chihuahua, and receive sup-

Erin Gott

Erin Gott

Left: Biologists use a mirror and binoculars to check an Aplomado nest site for eggs. *Right:* Two Aplomados rest in the shade below a hack tower in West Texas.

A solid understanding of this Aplomado Falcon population is essential to the success of the recovery effort. Information on mortality, adult turnover at nesting territories, pair fidelity, age of first breeding, and dispersal patterns are all important in predicting the long-term dynamics of this growing population and in guiding management actions. To obtain this information we identified as many individual birds as possible by reading their band numbers. Reading the small numbers engraved on the aluminum bands of highly mobile wildlife like an Aplomado Falcon in the brush country of South Texas is daunting, but our field crew rose to the challenge. Of the 74 known Aplomado Falcons, 65 individuals were positively identified. The bands of two individuals remained unread, while the seven remaining were unbanded. Texas is big country, and it is impossible to locate all nests.

We have been studying the population of about 30 pairs of Aplomado Falcons in Chihuahua, Mexico, for the past decade. The reproductive rate of this population has declined in apparent association with drought in the region. Habitat quality, primarily in relation to prey availability and predators, is thought to play an important role in the maintenance of Aplomado Falcon populations in the desert grasslands of the American Southwest. Our data since 1996 have therefore included annual characterization of vegetation composition and structure within falcon nesting territories in Chihuahua. With this large data set we are seeking to evaluate the effect of these variables on reproductive success. This year, as part of his Master's thesis, Alberto Macias was able to monitor 25 pairs of falcons, which fledged a total of 21 young. Alberto also conducted grassland bird studies in the area to determine changes in the falcon's prey base.

FUTURE PLANS

The Peregrine Fund will continue to release Aplomado Falcons in South and West Texas and to monitor Aplomado Falcon populations in both Texas and Chihuahua, Mexico. We will also continue collecting data on breeding success and adult turnover rate at nests in an effort to predict the long-term viability of these populations. Predation represents a significant impact on both the release effort and on the nesting success of established pairs. We will continue to develop innovative techniques both to reduce nestling mortality and increase fledging success. A priority will be to gather data describing the population structure and dynamics of the developing population in Texas and the population in northern Mexico.

Finally, a large part of what we do well as an organization is to put highly qualified people out into the field where they can actually do conservation. In this increasingly litigious and bureaucratic world, more and more conservation is being conducted indoors, in meetings, on the telephone, or via computers in the artificial setting of "virtual reality." But to be truly effective conservationists, we must experience, see, smell, and touch the very organisms and habitats that we are trying to conserve. Identifying and maintaining gifted and highly motivated personnel is vital to the success of this restoration effort.

port from many partners from the private sector. Working closely with Miguel Mora of the USFWS Patuxent Wildlife Research Center, we continue to analyze levels of environmental contaminants found in the blood collected from released falcons and from their addled eggs.

Providing essential financial support were the Lee and Ramona Bass Foundation, Ruth O'Donnell Mutch, Houston Endowment, Inc., The Brown Foundation, Inc. of Houston, National Fish and Wildlife Foundation, The Robert J. and Helen C. Kleberg Foundation, State of Texas, Turner Foundation, Inc., The Charles Engelhard Foundation, ExxonMobile Foundation, U.S. Fish and Wildlife Service-Region II, Geo-Marine, Inc., Jane Smith Turner Foundation, Central and Southwest Services, Inc., Earl C. Sams Foundation, World Wildlife Fund, Karen and Tim Hixon, Rusty Rose, Burlington Resources, Timken Family Trust, The Tapeats Fund, Joan and Herb Kelleher Charitable Foundation, Walter Negley, Herman Stude, Microsoft, Mike and Carolyn Maples, Pennzoil-Quaker State, and Volare Air Charter.

California Condor Program

GOAL

To 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.

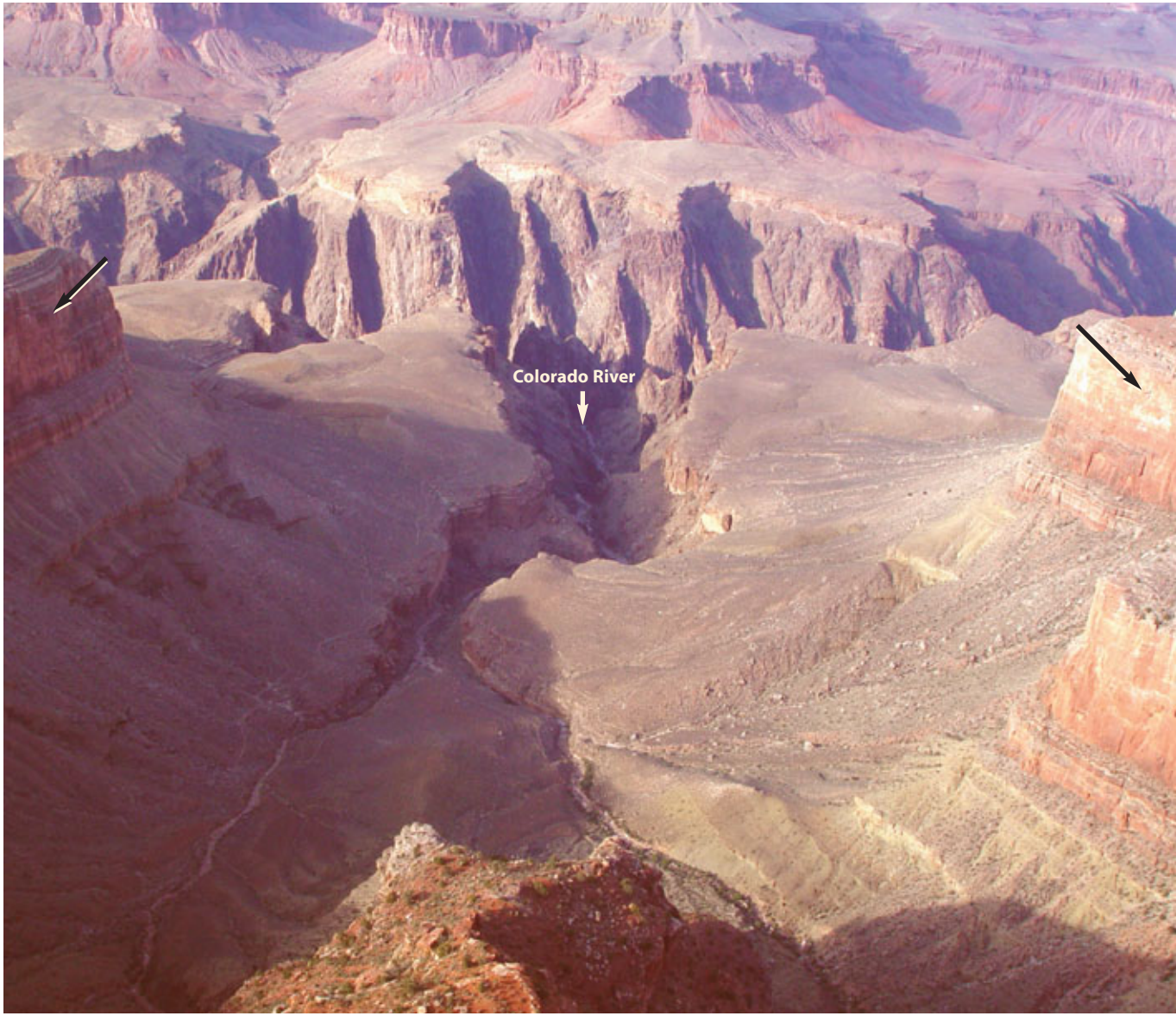
Bill Heinrich

This year was a very encouraging one for condors on almost all fronts. At year's end the entire world population was 198, up 15 individuals from last year's ending number, with 76 condors flying free. Twenty-two condors were produced in captivity, eight at our World Center for Birds of Prey, eight at the San Diego Wild Animal Park, and six at the Los Angeles Zoo. There were a total of five nesting attempts, three in California and two in Arizona. Congress approved $1,500,000 for construction and renovation at the three major breeding facilities. Along with all of the good news there were some major disappointments with two condors being deliberately shot in Arizona. Lead poisoning became an issue again this year providing us with additional challenges that we are now confronting.

RESULTS

As 2001 came to an end there were 11 young condors, pending release, above the Vermilion Cliffs in Arizona. Rather than releasing all young birds at once this year as we had in the past, we opted for a new strategy of having multiple, smaller releases, comprised of birds that we deemed most ready to fly free. Our first release occurred in February followed by a second in September, with the final one taking place in December. This new technique worked very well as it allowed smaller numbers of birds time to integrate gradually into the existing flock which totaled 33 free-flying condors in December 2002.

Also in 2002, two pairs of our released condors made Arizona history by laying one egg each in caves on cliffs in the Grand Canyon. While both pairs diligently incubated their respective eggs, they were not successful in hatching young. This is not unusual for young, inexperienced pairs. Ten additional condors engaged in courtship activity between January and April. We have the potential for five breeding pairs, and



Chris Parish

Above: Condor nest caves in the Grand Canyon at Dana Butte (left arrow) and Battleship (right arrow).
Opposite: Captive-bred Condor 119 nested at the Battleship cave with Condor 122.

Staff-Coordination, Bill Heinrich; Reintroduction, Chris Parish and Sophie Osborn; Research, Grainger Hunt and Chris Woods; Data Analysis Support, Rob Rose; Field Assistance, Roger Benefield, Kristine McConnell, Ann Burke, Kristine Lightner, Kevin Fairhurst, Kathryn Parmentier, Tyrone Donnelly, Jill Adams, Tim Bischof, Paul Mueller, Ann Welch, Dennis Mott, Elise A. Snyder, Chris Crow, Courtney Harris, David McGraw, Marta Curti, and our special volunteer, David Wall.

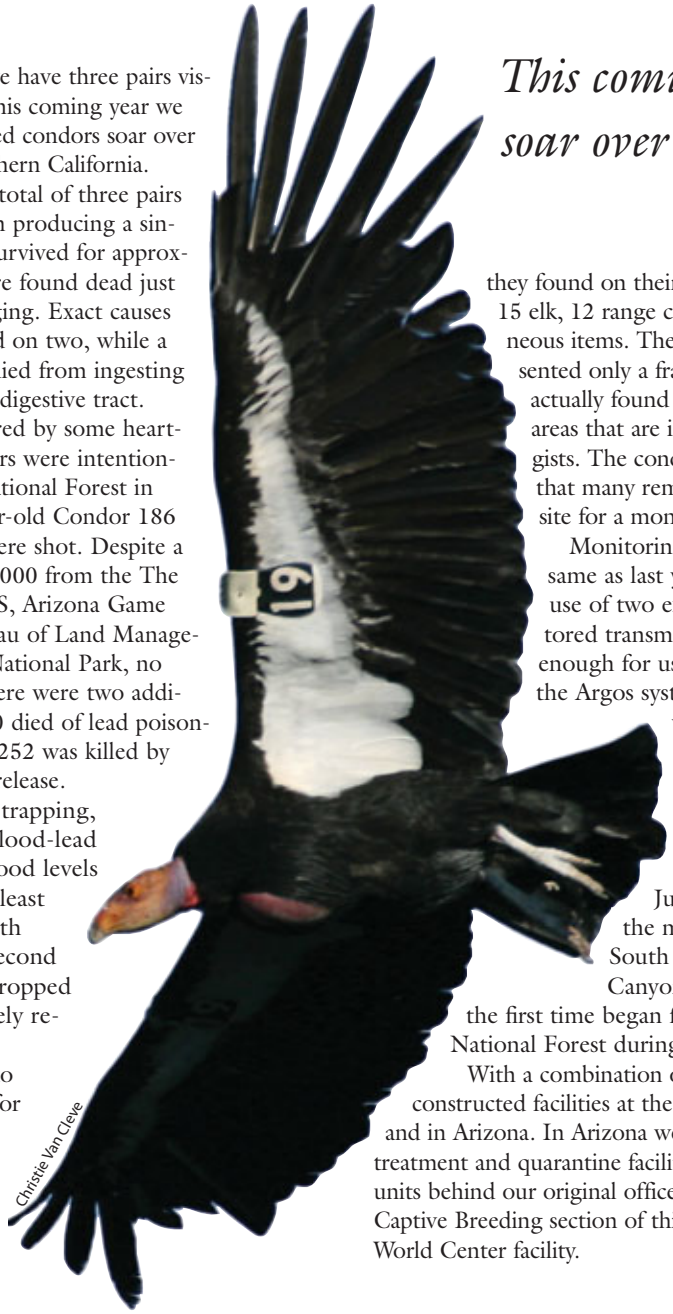
at the time of this writing we have three pairs visiting potential nest caves. This coming year we may see the first wild-hatched condors soar over the Grand Canyon and southern California.

In southern California a total of three pairs nested in remote caves, each producing a single chick. All three young survived for approximately five months but were found dead just prior to, or soon after, fledging. Exact causes of death were undetermined on two, while a third was thought to have died from ingesting foreign objects found in its digestive tract.

Our progress was tempered by some heartbreaking losses. Two condors were intentionally killed on the Kaibab National Forest in northern Arizona. Four-year-old Condor 186 and juvenile Condor 258 were shot. Despite a posted reward totaling $23,000 from the The Peregrine Fund, the USFWS, Arizona Game and Fish Department, Bureau of Land Management, and Grand Canyon National Park, no arrests have been made. There were two additional fatalities, Condor 240 died of lead poisoning in Utah, while Condor 252 was killed by coyotes a few days after its release.

During our routine fall trapping, 14 condors had elevated blood-lead levels. Of those, 12 had blood levels high enough to require at least one round of chelation, with four of those requiring a second round before their levels dropped enough for them to be safely re-released.

Although we continued to provide supplemental food for the condors, they proved to be very good at locating their own food. We documented condors feeding on over 65 carcasses that they found on their own, including 27 mule deer, 15 elk, 12 range cattle, and 11 other miscellaneous items. These carcasses most likely represented only a fraction of the food the birds actually found since the condors forage in areas that are inaccessible to the field biologists. The condors were finding so much food that many remained away from our feeding site for a month or more at a time.



Christie Van Cleve

This coming year we may see the first wild-hatched condors soar over the Grand Canyon and southern California.

Monitoring the condors was much the same as last year with the exception of the use of two experimental satellite-monitored transmitters, which performed well enough for us to become proficient in using the Argos system, putting maps up on our web site, and assisting the field biologists on locating the condors when they were unable to find them with the conventional transmitters. The condors were very active between June and November. They spent the majority of their time at the South and North Rims of Grand Canyon National Park, and then for the first time began foraging on the Kaibab National Forest during the end of summer and fall.

With a combination of public and private dollars we constructed facilities at the World Center for Birds of Prey and in Arizona. In Arizona we constructed a 1,152 sq ft treatment and quarantine facility and added four new housing units behind our original office and bunk housing. See the Captive Breeding section of this report for details on the World Center facility.

FUTURE PLANS

Before the end of 2003 we plan to have 41 condors flying free in northern Arizona and southern Utah. While continuing our management and monitoring of the released condors we will increase the scientific investigation directed by our senior scientist, Grainger Hunt, and publish much of our unique findings on condor behavior. Contributing to science and management, we will deploy the first experimental PTT units with Global Positioning System (GPS) capability. Microwave Telemetry is designing the PTTs to conform to the patagial mounting system that we have been using for the conventional transmitters. These new PTTs will allow us to know the exact locations of condors on a daily basis. This information will be used to form the basis of our understanding of the spatial dimensions of condor habitat, including seasonality of movements, preferred feeding areas, territories, and flight corridors.

We have initiated a collaborative effort with representation from the firearms industry, shooting sports, hunting and conservation groups, state and federal wildlife management agencies, and the California Condor Recovery Team to identify information gaps about the pathways in which lead becomes accessible to condors. By acknowledging the long and successful tradition of wildlife conservation among hunters, we will be seeking their voluntary assistance in helping us find ways of decreasing the chances of condors finding lead resulting from the use of firearms.

In our new breeding and holding facility we hope to raise even larger numbers of condors in the presence of adults. By raising young in this manner we feel that they more quickly key into adult condor behavior and become more fearful of humans sooner. Lastly, we are hoping that 2003 will be the year when the first wild-produced young fly with captive-produced condors over the Western skies.

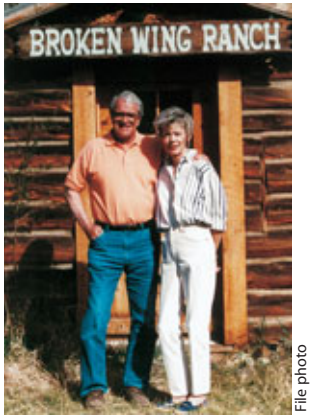
Cooperators-Cooperators are the U. S. Fish and Wildlife Service, the Arizona Game and Fish Department, the Bureau of Land Management, the National Park Service, the Los Angeles Zoo, and the Zoological Society of San Diego, as well as the local ranchers and lodge owners. Norm Freeman, Catalina Flying Boats, Inc., and the Bureau of Land Management assisted with transportation of the condors. Our special thanks to Maggie Sacher.

Financial assistance this year was provided by the U. S. Fish and Wildlife Service, Nina Mason Pulliam Charitable Trust, The Charles Engelhard Foundation, Chichester duPont Foundation, Inc., Turner Foundation, Inc.,The Walt Disney Company Foundation Conservation Awards, Patagonia, The Kearney Alliance, Norcross Wildlife Foundation, Inc., Wallace Research Foundation, Jane Turner Smith Foundation, Sydney S. Byers Charitable Trust, Globe Foundation, Ashley Dorrance/Geneva Fund, Bureau of Land Management, Arizona, Conni Pfendler, and Grand Canyon Conservation Fund.

Gerald D. and Kathryn S. Herrick Collections Building

GOAL

To develop sufficient secure space to house and allow for effective use of the research library, specimen collections, and Archives of American Falconry at the World Center for Birds of Prey.



File photo

Jack Cafferty

Above: Jerry and Kathy Herrick at their ranch.
Below: Plaque recognizing falconers' contributions.

Having enough secure usable space to house the library, falconry archives, and scientific specimen holdings of The Peregrine Fund has been an increasing challenge over the past decade as each has rapidly grown and expanded. The library had spread into three rooms in two buildings and all were areas also used for other purposes, making effective use of the books and journals difficult and there was no room for continued growth. Even though we had constructed a large room in 1990 for the Archives of American Falconry collection, capacity for archival storage was exceeded and there was not reasonable access to the collection for use by scholars, the request for which has been on the increase. We were in a similar situation with our carefully preserved collection of bird specimens and the thousands of raptor eggs. The solution to this dilemma came posthumously from long-time supporters of the organization Jerry and Kathy Herrick. During their lives they established a bequest to The Peregrine Fund. Receiving those funds, and with the additional contributions from many other people, we were able to turn our needs and dreams into action and results. Helping ensure these results were achieved was our Chairman of the Board, Jim Nelson, who did everything from contributing and raising donations to assisting his wife Karin in designing and directing the landscaping. Also of critical help was founding Board member Bob Berry who, through his foundation, financially matched most donations from falconers.

Jack Cafferty

The finished Collections Building.

RESULTS

The 10,000 sq ft Gerald D. and Kathryn S. Herrick Collections Building opened in September 2002, just in time for our Board of Directors' meeting. As with all facilities accomplished by The Peregrine Fund since 1983, this structure was designed and construction overseen by architect Hal Maxey (Maxey Tookey Architects) and as always, totally as a donation. Hal's "can do," solution-oriented, practical, and cost effective methods are a good fit for The Peregrine Fund. The Collections Building is yet another example of his ability.

The James N. Rice Wing of the falconry archives portion of the new building occupies about half the building and includes a large display and storage/work rooms. The north wall of the display room is glass and looking across a covered patio one can see the Boise valley and front range mountains. The windows have movable see-through blinds to eliminate any harmful UV sun rays from reaching the collection. Two galleries for paintings extend from the display room and a special dark room exists within the storage/work area for holding artwork not on display. Many other special features are designed into this one-of-a-kind facility to preserve and display the holdings.

The library rooms and areas occupy most of the other half of the building. Library shelving is less than half filled to ensure long-term opportunities for expansion of the holdings. At a time when most libraries are short of space and even disposing of printed materials, we are in a position to accept books, journals, etc. of scientific value. Beyond the primary library room are smaller rooms for the reprint library, video and film library, and duplicate books and journals. In addition there are two offices for visiting scholars. Although this is not a lending library, researchers are welcome to visit and utilize its extensive holdings.

The collection of egg and bird specimens is stored in especially designed cabinets held within one large room. The specimen room, like the other two primary areas within the building, has a separate temperature control. This room is maintained at lower temperatures than other areas.

The hallways connecting the various rooms and areas display original art by John Schmitt and very large photographs donated by Robert Comstock. The photos were taken by Daniel O'Niell in Mongolia during a trip taken by Rob, Daniel, and Bill Burnham to interview Mongolian falconers.

Cooperators-Major support for the Gerald D. and Kathryn S. Herrick Collections Building was provided by the Wolf Creek Charitable Foundation, Maxey Tookey Architects, Jim and Karin Nelson, Laura Moore Cunningham Foundation, the Grasslans Charitable Foundation, the Eyas Foundation, Ruth O. and Brian Mutch, Ash Grove Cement Company, Walter C. Hill and Family Foundation, John and Vicki Swift, Doug and Meredith Carnahan and Jayker Wholesale Nursery, Inc., Sally Spofford, Yvon Chouinard, Frank Bond, Kent Carnie, Robert D. MacIntyre, Scott Struthers, Ross Matteson, Jed Lavitt, Robert B. Winslow, William Cornatzer, Pete and Kristi Edmunds, Timkin Family Charitable Trust, Gary and Becky Boberg, Sterling Bunnell, Thomas Cantella, Keith P. Carpenter, Jim L. Cook, Louis A. Feher, Caroline Forgason, Mimi Heiberg, Maine Falconry and Hawk Trust, Velma Morrison, North American Falconers Association, Oregon Falconers Association, and Sheldon Severinghaus.

Archives of American Falconry

GOAL

To collect and conserve evidence of the history of falconry and to document the role of falconers in raptor conservation in the Americas.

The Archives of American Falconry was established in 1986 to preserve invaluable collections of historical falconry memorabilia as pioneer American falconers began to die. Since then, it has become much more than just an archival resting place for old books, correspondence, photographs, art, manuscripts, equipment, and falconry memorabilia. The Archives is a dynamic collection integrating history with the present day from which scholars or an aspiring falconer can learn and better understand the sport and the people who practice it and their place in the past, the present, and even the future.

RESULTS

Without question THE highlight of our archival year was the move into our quarters in the new Gerald D. and Kathryn S. Herrick Collections Building. Both highly functional and beautiful, these facilities are a valuable addition to the World Center. The American falconry community generously donated $400,000 to make these facilities all we could hope for, not only to meet our current needs, but also designed for the long-term future. It is a tribute to the farsightedness of this small (ca. 5,000) group of sportsmen/women dedicated to their sport and to the well being of the birds they employ.

By participating in the building's design from the very beginning we have ensured a wealth of space to both display and store falconry-associated art, the lack of which was a severe handicap in our former quarters. Similarly, the overall proportions of the new facility—almost five times the floor space of our old James N. Rice Wing quarters—ensure that it will be a long time before we outgrow our new storage capacity. We are retaining the Rice Wing designation of our old quarters since the conversion of that former space to non-archival administrative facilities.

Although seemingly less dramatic, the formal designation of John Swift as Curator of Books and Manuscripts not only reflects the fact that John has been the source of almost a third of our library holdings, but it also recognizes his long association and non-financial as well as financial assistance with the Archives. Formally adding John to our staff (like the Curator, it is voluntary), even if currently from his present home in Tucson, considerably reduces Kent's work. Hopefully, too, John's presence on our staff may provide a source of future leadership for the Archives itself.

Jack Cafferty

Left: Robert Berry, Tom Cade, and Kent Carnie cut a ceremonial ribbon to dedicate the new Archives wing. *Below:* Display room at the Archives of American Falconry.

Despite our distractions completing the new facilities, historic materials have continued to arrive. These have included items ranging from a uniquely decorated hood by Tom Harms, a little-known but highly skilled Nebraska falconer and craftsman, donated by Bob Linderholm, owner of the bird for which the hood was made and former President of the Nebraska Falconers Association, all the way to an authentic Central Asian eagle falconer's fur-lined hat and oversized glove brought from Mongolia by world-traveling New Mexico falconer Pat Herrington.

Other donations include a copy of Beebe and Webster's standard text, hand-inscribed at length in olde English, closing with: "Thys booke of hawkynge I giff to Toney Hewston that he may have hardynesse and noble herte. Giffen thys daye of Jesu byrth 1964" and signed by "Jehan Stynebec de Montroy"—(Nobel Prize winning John Steinbeck of *Grapes of Wrath* fame) and donated by that same "Toney Hewston" (Tony Huston). Given the provenance of this volume and the fact that Steinbeck had a lifelong fascination with the Arthurian legend and wrote his own little-known book on the subject (*The Acts of King Arthur and His Noble Knights,* 1976), not to mention the great public interest in Steinbeck's works, this is an especially treasured addition.

A gift from Stan Marcus of the great *Traite de Fauconnerie,* the mid-19th Century folio-sized collection of hand-colored stone lithographs of European falconry and falcons, is special to us all. This copy was previously owned by Luff Meredith, "The Father of American Falconry," whose own manuscript the Archives published two years ago. Significantly, the arrival of the Meredith/Marcus *Traite* pushed the value of the material donations from the falconry community to the AAF collections to over one million dollars. With its special interest due to Meredith's ownership, it released a duplicate copy already in the AAF library, proceeds from which then helped pay for the last few bricks to complete our new quarters—yet another manifestation of Meredith's influence on the American falconry scene, even today. Coincidently, our new quarters are now graced by an original oil portrait of Meredith, presented this year by his son and daughter, Bill and Anne, and painted by no less than Meredith's German counterpart, Renz Waller, the grand old man of German falconry.

Jack Cafferty

FUTURE PLANS

With the new facilities completed and our new Curator of Books and Manuscripts aboard, we can now turn our focus to archiving the variety of collections received while our attentions have been diverted toward developing our new quarters. The collection and maintenance of historical materials is a never-ending process. As mundane as the physical administration of this function might seem, it is, truly, the real reason for our existence.

Staff-Curator Archivist, Kent Carnie; Book and Manuscript Curator, John Swift; Associates: Research/Editorial, Bill Mattox, Research, Peter Devers and Natalie Nicholson, Graphics, Don Garlock and Jim Stabler.

Cooperators-The Archives of American Falconry (AAF) is dependent on the generous support of many friends, falconers and non-falconers alike. In 2002 particularly noteworthy assistance was received from Laura Belkin, Garry Boberg, Frank Bond, Kent Carnie, Keith Carpenter, Yvon Chouinard, Jim Cook, Peter Devers, Pete and Kristi Edmunds, Andy Feher, Elana Gatti, Mimi Heiberg, Walter Hill, Tony Huston, Jed Lavitt, Rob MacIntyre, Maine Falconry and Raptor Conservancy, Stan Marcus, Ross Matteson, Bill and Anne Meredith, Dick Musser, Brian and Ruth Mutch, North American Falconers Association, Geoff Nye, Oregon Falconers Association, Kathleen Orlenko, Frank Serra, Will Shor, Scott Struthers, John and Vicki Swift, Peter Toot, Skip Tubbs and Judith King, Jim Weaver, Pete Widener, Bob Winslow, and the estate of the late Martha Weiser.

Student Education

GOAL

To identify and/or provide research and educational opportunities for undergraduate and graduate students, both in the United States and other countries, especially in connection with our field programs.

RESULTS

Cumulative: Supporting the studies of graduate students continues to represent a significant part of The Peregrine Fund mission, and, conversely, the contributions of the students have often been critical to the success of our field programs. Beginning in 1970 at Cornell University, we have directly assisted students in obtaining 52 advanced degrees, including 15 Ph.D.s and 37 M.Sc. degrees or equivalents.

2002: Students were supported in connection with six different projects in 2002. They included five M.Sc. students in Pakistan, Jamshed Chaudhry, Shahid Mahmood, Shakeel Ahmed, Muhammad Arshad, and Ahmad Ali, who are involved in different aspects of the Asian Vulture Crisis Project. Travis Booms completed his M.Sc. degree at Boise State University with his study on the food habits of Gyrfalcons in Greenland, and Kurt Burnham continued his doctoral program at Oxford University with his research on Peregrines and Gyrfalcons. In Mongolia, Nyambayar Batbayar conducted field studies on the Cinereous Vulture as he pursues an M.Sc. degree in the Raptor Biology program at Boise State University.

In the Neotropics, Ricardo Gil de Costa published the results of his studies of predator-prey behavior as a sidelight of our release of Harpy Eagles in Panama in connection with his pursuit of a Ph.D. at Harvard University. Other students involved in studies associated with the Harpy Eagle project included Johana Cedeño, Humberto Fossatii, and Felix Sandoval, B.Sc. Honors candidates at the University of Panama, who studied Harpy Eagle behavior during release; Katie Harper, a B.Sc. degree candidate at McGill University, who studied the behavior of captive breeding Harpy Eagles; and Dane Springmeyer, a Thomas J. Watson Fellow, Middlebury College, also participated in the Harpy Eagle release project.

In the African region, Catherine Gatome graduated with an M.Sc. in Wild Animal Health from the University of London with a hemo-diagnostic study of African White-backed Vultures in Kenya. Festus Ihwagi, an M.Sc. candidate in Conservation Biology at the University of Nairobi, studied *Gyps* vulture populations in Kenya. In Madagascar, two students received our support, including Ruth Tingay, a Ph.D. candidate at the University of Nottingham, who continued her field studies and laboratory work to determine paternity and relatedness among cooperative breeding Madagascar Fish Eagles, and Tolojanahary Andriamala, who completed his first season of field work studying the ecology of the Yellow-billed Kite in western Madagascar.

Munir Virani

Kenyan students Festus Ihwagi and Catherine Gatome handle a vulture trapped for a blood chemistry study in Kenya.

FUTURE PLANS

We will continue providing financial support and field opportunities to these students and look for other promising candidates whose interests and skills fit well with our field projects. As always, we will continue to encourage the publication of theses and dissertations by former graduate students.

Staff-Students are supervised by their respective project leaders in cooperation with their advisors at their parent institutions.

Scientific Publications and Presentations

GOAL

To present the results of research studies to scientific forums, government agencies, and interested groups.

RESULTS

Cumulative: By the end of 2002, 893 publications, including 325 technical journal articles, dissertations, and theses, had been produced by The Peregrine Fund staff biologists and associates.

2002: Sixty publications by The Peregrine Fund contributors appeared in 2002, including eight from the Madagascar Project, six from the Aplomado Falcon Project, and five from the Asian Vulture Crisis Project.

Numerous presentations were made by staff members at scientific meetings, symposia, and workshops. Munir Virani attended the 23rd International Ornithological Congress held in Beijing, China, in August and co-convened a workshop on the Asian Vulture Crisis there. Six presentations were given at the 3rd North American Ornithological Conference in New Orleans in September by our staff members and associates, including two each on the Asian vulture crisis, the California Condor project, and the Aplomado Falcon project. Lloyd Kiff made presentations on the California Condor and Aplomado Falcon projects at the semi-annual meeting of the American Bird Conservancy Policy Council in Washington, D.C., in March.

Our Panamanian arm, Fondo Peregrino–Panamá, organized a conference on Neotropical raptors, including a symposium on the Harpy Eagle, in Panama in October that featured 100 oral and poster presentations, 15 of which were given by staff members of The Peregrine Fund/Fondo Peregrino–Panamá. The conference was attended by 150 delegates from 16 countries. The Peregrine Fund provided 30 grants to make conference participation by Latin Americans possible.

FUTURE PLANS

A book on the history of the Peregrine restoration effort will be published in October of 2003. The Maya forest raptor book should be printed in 2004 by Cornell University Press. Books on other species, e.g., the Madagascar Fish Eagle, that have been the subject of our studies are in the early planning stages. As always, we will continue to work hard to close the gap between data gathered and results published.

Staff-Project leaders and individual staff members are responsible for reporting the results of their research. Lloyd Kiff maintains the bibliography of The Peregrine Fund publications.

Research Library

GOAL

To 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 biological community.

RESULTS

Cumulative: The proliferation of information in the field of conservation biology has made it increasingly difficult for researchers and institutions to keep abreast of current information, and this can result in unnecessary duplication of efforts. Since an assessment of existing knowledge is the logical starting point for any research or conservation project, access to good library resources is essential. Owing to the lack of an adequate biological library in the Intermountain Region, and our desire to have a world class research library, a decision was made in 1994 to create a research library at the World Center for Birds of Prey. By now, the library catalog contains over 13,500 titles, mostly on birds, and partial or complete runs of over a thousand journal and magazine titles. By the end of 2002 the catalogued reprint collection contained over 13,000 items, with another 10,000 awaiting cataloging, and subscriptions or exchange agreements were being maintained for about 300 technical journals, magazines, and newsletters. Our Research Library now ranks among the 10 largest collections on birds and related natural history topics in North America.

2002: A major milestone was reached in September, 2002 when The Peregrine Fund Research Library was moved into new quarters in the Gerald D. and Kathryn S. Herrick Collections Building. The move involved the transfer of nearly 2,000 cartons of books and journals from numerous storage areas.

In 2002, computerized versions of the library catalog, reprints catalog, and journal inventory were further refined and placed on line on The Peregrine Fund website, where they can be searched or downloaded by any interested student or researcher anywhere in the world. Requests from researchers all over the world for copies of hard-to-obtain publications were answered by e-mail, fax, and postal mail during the year, and the frequency of use of the collections by off-site users is growing almost exponentially as the library is discovered and becomes better publicized.

Significant gifts of journals and books were received from many donors, including Bill Clark, Cognizant Communication Corporation, Charles Collins, Don Conner, the Estate of Maxine Kiff, J. Michael Scott, Sally Spofford, Santa Cruz Predatory Bird Research Group, Snake River Field Station, Jared Verner, and Dave Whitacre. A particularly large collection of ornithological journals was donated in May by Howard Cogswell, of Hayward, California. In addition, numerous exchanges were made with other institutional natural history libraries, all of which resulted in useful additions to our collections.

FUTURE PLANS

The Research Library will continue to grow in size and global significance. At a time when some libraries are replacing books and journal runs with electronic versions, we are seeking to preserve paper copies of as much of the relevant conservation literature as possible and to make information widely available by electronic techniques. It is our hope that we can soon supply pdf copies of the literature gratis to researchers by e-mail, thus expanding the size of our clientele by many orders of magnitude over what we might expect in terms of on-site visitors. 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 website. 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 Assistant Librarian Lynda Leppert.

Jack Cafferty

Left: The new library provides ample space for journals and books, along with work areas for researchers.

Specimen Collection

Lloyd Kiff holds a Harpy Eagle study skin in the Specimens Room at the new Gerald D. and Kathryn S. Herrick Collections Building. The specimens include eggs and study skins from dozens of raptor species, and is available to visiting researchers and students as well as Peregrine Fund staff.

Jack Cafferty

Education Program

GOAL

To educate the public and students about birds of prey and the importance of conservation of biological diversity, focusing on The Peregrine Fund's numerous successes in achieving results toward this conservation goal.

Our formal Education Program began in 1985 when we received our first visitors at the World Center for Birds of Prey in Boise. Driven by increased visitor demand, facilities were improved and culminated in the dedication of the Velma Morrison Interpretive Center in 1994. We continue to improve our education program and visitor center displays in order to better educate and inspire our visitors. Each year more than 100 volunteers donate their time and service toward educating the public.

RESULTS 2002

Our Education Program directly reached more than 31,000 children and adults this year. Almost 5,400 visited with school groups, 450 enjoyed our annual open house, and nearly 3,500 were reached in offsite programs. The remainder of our guests visited on their own or as part of a prearranged tour. According to our annual survey, one-third of our visitors live in Idaho. Similar to previous years, all 50 states were represented in the survey as well as 30 foreign countries.

When the Harpy Eagle breeding program moved to Panama, the visitors center gained use of the Herrick Tropical Raptor Building. Acquisition of this building added office space, a raptor food preparation area, and numerous bird chambers. Representatives of the species we are currently breeding, the Aplomado Falcon, the Harpy Eagle, and the California Condor, are on public view. In addition, a Turkey Vulture, Eurasian Eagle Owl, and Northern Harrier were added to the program, increasing the visitor's opportunity to see unique birds of prey from around the world.

The Discovery Room is complete and is popular with the whole family. Although geared toward children, the enlightening process of exploration and discovery in this remarkable exhibit is enjoyed by everyone. Guests track the development of a falcon from the egg through fledging, solve a puzzle by matching the eggs to their appropriate nest, discover how birds ensure the success of future generations, and participate in hands-on activities to explore how birds master flight.

In continuing to offer the highest quality education to all schools, we are expanding our education program. The Science Achievement Standards adopted by the Idaho State Board of Education are being integrated into our K-12 school program. We also began a free admission program for schools with more than 70% of their students in the National School Lunch Program. Finally, a scheduling program was installed so tour bookings and volunteers can be scheduled from any computer in the visitors center.

We have an exceptional group of volunteers who have given over 8,000 hours this year. Volunteers come from many walks of life and have a variety of unique skills that make the Education Program successful. The dedication of our volunteers has enabled us to create an unequaled experience for our visitors, and our volunteers have our sincerest thanks.

FUTURE PLANS

We will continue to improve our education program for school groups and public visitors. The culmination of our K-12 program will give school-aged groups a focused program that meets the Idaho science standards for each grade level. In addition, our public visitors will enjoy a program that offers more flexibility to experience the center at their own pace. The docents will conduct bird presentations and brief subject talks at scheduled times throughout the day.

Jack Cafferty

Left: Entry to the World Center for Birds of Prey.
Below: Kim Middleton, our new Interpretive Center Manager, speaks with a group of visitors about the harrier on her fist.


Jack Cafferty

Staff-Interpretive Center Manager, Kim Middleton; Volunteers and Gift Shop, Brook Sims; Education Assistant, Trish Nixon; and Facility Maintenance, Paul Malone.

Volunteers Contributing Over 100 Hours of Service-Mark Armstrong, Pat Baumback, Karen Brender, Amy Brueck, Gwen Chavarria, Bert Cleaveland, Helen Crewse, Allen Dickson, Betsy Eldredge, Phil Eldredge, Leo Faddis, Claudia Fernsworth, Anne Fitzsimmons, Linda Fraser, Joni Frey, Bill Gehring, Scott Goodkin, Karen Gross, Kathryn Hampton, Jerry Heimbuch, Bryan Jennings, Connie Leavitt, Fred Lidinsky, Michelle Lynch, Mike McSweeney, Scott Meissner, Milton Melzian, Shani Murray, Jack Osgood, Brit Peterson, Randy Rasmussen, Mary Rotman, Kendra Smith, Chan Springer, Josh Stevens, Diann Stone, Henry Tamcke Jr., and Dick Thatcher.

Cooperators-Our financial partners in education include the Laura Moore Cunningham Foundation, U. S. Bancorp Foundation, the Harry W. Morrison Foundation, Inc., Union Pacific Foundation, J.A. & Kathryn Albertson Foundation, Boise Cascade Corporation, Islands Fund, Bank of America Foundation, Wells Fargo Bank, Albertson's Inc., Catapult 3, Weyerhaeuser Company Foundation, The ConAgra Foundation, and numerous individual donors.

Captive Breeding at the World Center for Birds of Prey

GOAL

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

Captive propagation at the World Center is a highly focused, technical, labor intensive endeavor that is annually accomplished with great care and dedication by all involved. It is not possible to make birds of prey breed in captivity. You can only place them in the best possible situations for breeding likely to occur while reducing as many distractions as possible, including human-caused disturbance. Considering both the Aplomado Falcon and California Condor restoration programs are annually dependent on birds for release to the wild, captive propagation at the World Center is very important.

RESULTS

Aplomado Falcon—In 2002, 35 Aplomado Falcons laid 281 eggs, of which 162 (58%) were fertile, 124 (77%) hatched, and 120 (97%) survived to release age. Four females laid for the first time while one falcon laying in 2001 did not lay in 2002. Of the females laying for the first time, none copulated with their mates, but three were artificially inseminated (AI), and nine young were produced. AI also contributed very importantly to the total production of falcons, resulting in 93 additional young. Only 18 falcons were produced from copulating pairs. Ten young were retained for captive breeding and the remainder were released to the wild.

As in past years, we depended heavily on captive Peregrine Falcons to provide initial egg incubation. Falcon eggs hatch better in artificial incubators if they first have several days of incubation under falcons. Aplomado Falcons will regularly lay eight or more eggs if each egg is removed as it is laid. Without egg removal, they will begin incubation after laying three or four eggs. Using AI and egg removal, then incubation by Peregrine Falcons, we greatly increase the number of young that can be raised. Peregrines provided initial incubation for 136 of the 162 fertile Aplomado Falcon eggs from which 104 falcons hatched and survived.

We are anticipating another excellent year for Aplomado Falcon reproduction in 2003. We hope to have three or four additional laying females. Cold spring weather seemed to affect our copulating pairs negatively in 2002, and the return of more typical weather next season could enhance results.

California Condor—We have 19 pairs of California Condors at the World Center. After the 2001 breeding season we re-paired three pairs to enhance the potential for copulation while still maintaining the desired genetic mix. Re-pairing over the past two years has so far resulted in one female producing her first fertile egg (2001) and a male siring his first chick (2002). In the 2002 breeding season we had 17 pairs produce 19 eggs, of which 11 were fertile (58%), eight hatched (72%), and all chicks survived. We had hoped for greater reproduction but noise from a construction project, even though several hundred meters away, seemed to distract the condors, affecting production.

Based on a need for additional facilities for incubation and brooding space, a better location for rearing young condors where they can observe adults, and a desire for more holding space for young condors prior to release, in fall/winter 2002 we constructed a third condor building. The 8,000 sq ft building includes incubator and brooder laboratories and two holding flights. The construction was funded by a combination of private and public (U.S. Fish and Wildlife Service) dollars and in-kind contributions.

Our expectation for increased reproduction in 2003 is guarded because of the fall/winter construction. Courtship by condors begins in November and the construction was not completed and quiet resumed until the end of January, just before egg laying began. Hopefully, with the renewed calm, courtship will rapidly increase and adults will accomplish proper egg incubation and rearing of young. ■

Erin Gott

Production of Aplomado Falcons at the World Center for Birds of Prey has increased dramatically from 1991 to the present.

Staff-Captive propagation at the World Center is accomplished by Cal Sandfort (Aplomado Falcons) and Randy Townsend (California Condors) with assistance from Craig Carpenter and Randy Stevens. Food production is managed by Amel Mustic with assistance from Roy Britton and Dalibor Pongs. Facility maintenance is under the direction of Randy Stevens.
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. 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).

High Arctic Institute

GOAL

To develop scientific understanding and conserve Gyrfalcon and Peregrine Falcon populations and their environments in Greenland.

Greenland measures 1,660 miles (2,656 km) long and is about 650 miles (1,045 km) at its widest location. Ice-free land exists only on the periphery as 85% of the island is covered by a huge icecap rising to 11,000 feet (330 m). Our work in 2002 was focused in two locations, just above the Arctic Circle in the Kangerlussuaq (formerly Søndre Strømfjord) area, West Greenland, and about 600 miles (965 km) further north in the High Arctic region of North Greenland.

Peregrine Falcons have greatly increased in Greenland since the 1970s when research on them was begun there, and they now annually number in the thousands of breeding pairs. Less is known about the status of the Gyrfalcon, but some information suggests its range and numbers may have

Kurt K. Burnham

Peregrine on cliff overlooking North Star Bay.

Jack Stephens, jackstephensimages.com

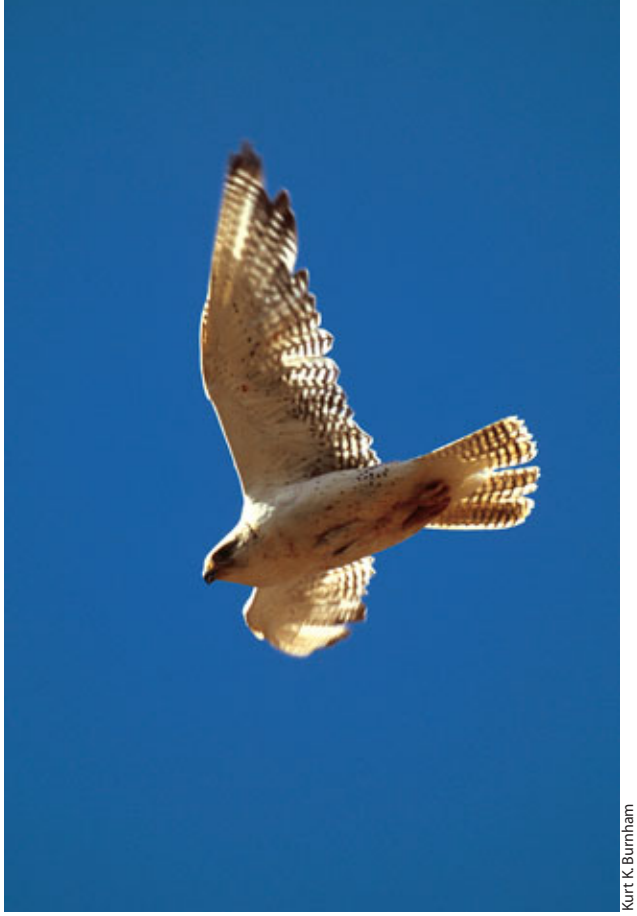
Ptarmigan are an important food source for Gyrfalcons in Greenland.

Staff-Kurt Burnham manages this project under the general direction of Bill Burnham and with special assistance provided by Ian Newton and Bill Mattox. Jack Stephens is the Thule coordinator and lives in the High Arctic Institute facility. Data analysis support is provided by Rob Rose. Also participating in 2002 were Jack Cafferty, Martin Gilbert, Erin Gott, Regan Haswell, Bill Heinrich, Pete and Jacque Jenny, Ruth and Brian Mutch, Calen Offield, Rob Rose, Bianca Perren, Cal Sandfort, and Peter Widener.

Cooperators-Cooperating in the work through authorizations are the Commission for Scientific Research in Greenland, Greenland Home Rule Government, Danish Polar Center, and the United States Air Force. The U.S. government project sponsor is the Department of the Interior/Bureau of Land Management.

decreased. Directly affecting both species is the delicate Arctic environment, which also indirectly affects them by its influence on the prey on which they depend, especially when breeding. The falcons in the Kangerlussuaq area primarily feed on ptarmigan and songbirds, while those in the High Arctic are heavily dependent on seabirds. An ameliorating environment may be favoring some species more than others, to include the falcons. We are working to understand the dynamics between Gyrfalcons and Peregrines and their environments. Although many aspects of the field work in this sometimes harsh and always physically demanding Arctic environment remain as they have since the beginning, technology is helping us accomplish what was in the past impossible. Satellite-monitored transmitters (PTTs) allow us to understand the size of the area falcons use and where they are when not at breeding sites. Using small amounts of collected blood and feathers, we are determining the uniqueness and variation within and between the breeding populations in these widely separated areas in Greenland. Combining the traditional tools and techniques of raptor biology with 21st Century capabilities is greatly enhancing results. Better information is a critical tool for conservation of species and habitats.

Despite the 2002 field season being our most ambitious yet, we were still able to attain the majority of our objectives. From Kangerlussuaq we surveyed 55 known Gyrfalcon eyries and additional cliffs, placing PTTs on Gyrfalcons and Peregrines while collecting samples for genetic research. From the High Arctic Institute facility, Thule, Greenland, we re-surveyed Peregrine and Gyrfalcon eyries and again expanded investigations further north than in previous years, finding Gyrfalcon eyries and an apparently increasing number of Peregrines. PTTs were also placed on Gyrfalcons and Peregrines there and genetic material collected. A variety of other information was also collected in each area, not only about the falcons, but also about their prey and the general environment. During the autumn we operated a capture site for falcons just south of the Arctic Circle in West Greenland where we deployed additional PTTs and collected genetic material on Gyrfalcons while only banding the Peregrines.

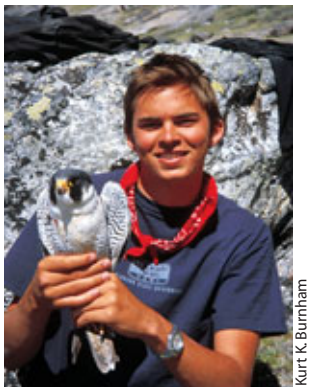


Kurt K. Burnham

FUTURE PLANS

While continuing to monitor Peregrines and Gyrfalcons with PTTs, we will deploy additional units on falcons to fill gaps in our information while removing the transmitters from birds for which data collection is complete. Genetic material will be analyzed and likewise more collected as needed and possible. Analysis of climate data over the past 50 years for each study area will be completed and results compared for ecological information. We will again push falcon surveys and information collection further to the north in Greenland to help understand what is occurring with Peregrine and Gyrfalcon populations in one of the world's most extreme environments.

Kurt K. Burnham



Kurt K. Burnham

Left: Flying adult female Gyrfalcon defends her eyrie.

Young raptor enthusiasts Peter Widener (above) and Calen Offield (below) experienced the arctic and hands-on work with birds of prey.

Financial support for this field season was provided by The Charles Engelhard Foundation, Ruth Mutch, Paxson H. Offield, the Eyas Foundation, and William Burnham.

Special thanks for the cooperation and friendship of the residents of Thule Air Base. We also thank the 109th Air National Guard for their critical logistical support and recognize the National Science Foundation for their cooperation. In addition, we thank VECO and the Kangerlussuaq crew of Tom Quinn, Robin Abott, Ed Stockard, and Sparky for their help and friendship and Bent Brodersen, the exceptional manager of the Kangerlussuaq International Science Support facility. The cooperation and assistance of Kim Pelle and Greenland Contractors are also appreciated. The continued cooperation of Knud Falk, Danish Polar Center, and Kaj Kampp, Copenhagen Zoological Museum is valued. We thank Mark Fuller and the Raptor Research and Technical Assistance Center/Boise State University.

Angel Muela

Neotropical Raptor Conservation Program

The Neotropical Raptor Conservation Program is a strategic approach to conservation of birds of prey in the biologically similar Latin American and Carribean regions. Of 86 diurnal raptors that occur in the Neotropics, 16 are endangered or vulnerable, and 21 are too little known to even guess their status. Habitat degradation and loss, persecution, and environmental contamination are the greatest threats to survival of raptor species. This program builds on over two decades of work by The Peregrine Fund in the Neotropics to conserve species in jeopardy, biodiversity, and the habitats that support them both. The Neotropical Raptor Center and Fondo Peregrino–Panamá provide a centrally located tropical raptor propagation facility and base of operations for the program. We combine field studies, information, training, public education, hands-on species restoration, and leadership to achieve measurable results for conservation.

GOAL

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

RESULTS

We continued building and training our local staff in Panama, including adding an education director and assistants in raptor propagation, food production, and bookkeeping.

We completed the first Neotropical Raptor Conference and Harpy Eagle Symposium in October 2002 with attendance by over 150 people from 16 countries making 100 presentations. The meeting was an important networking event to enhance international communication and cooperation towards raptor conservation in the Neotropics and resulted in agreement for the need and value of a Neotropical Raptor Network. The conference provided new information on the conservation status, breeding, and biology of the Harpy Eagle and other raptors, much of which is accessible through our website at: *http://peregrinefund.org/GRIN/GRIN_Home.html.*

We assisted Eng. Ricardo Anguizola, Administrator of ANAM, in presenting a proposal to the Central American Commission on the Environment and Development (CCAD) to restore the Harpy Eagle to the Mesoamerican Biological Corridor and are hopeful that this may set the stage for a long-term commitment for conservation of Harpy Eagles and their habitat throughout Central America. Other projects are described in detail in the following pages.

FUTURE PLANS

We need to continue building staff capacity. We will continue seeking new areas in which we can have positive conservation impact, to include field studies in pure and applied conservation biology. We will begin developing the Neotropical Raptor Network as a source of communication and collaboration between biologists, falconers, decision and policy makers, and conservationists at large.

Above: Conference materials for the first-ever Harpy Eagle Symposium, held last October in Panama.
Left: Magaly Linares delivering a certificate of Honorable Mention during the prize-awarding ceremony to a student who participated in the contest "Name a Harpy Eagle and Become a Scientist for a Day."

Staff-The Neotropical Raptor Conservation Program is directed by Rick Watson and Magaly Linares, assisted by Yanina Guevara, Margarita Gordon, and project staff listed separately in the individual program sections of this report. Dave Whitacre is senior scientist for this program, and Leo Salas provided direction through 2002.

Cooperators-The partnership of many organizations and individuals has made this program possible including Autoridad del Canal de Panama (ACP), Autoridad Nacional del Ambiente (ANAM), Autoridad de la Region Interoceania (ARI), and Fundacion Ciudad del Saber. Jacobo Lacs, who serves on our Board of Directors, provides invaluable support and assistance.

Important financial support in 2002 was provided by Wolf Creek Charitable Trust, Hank and Wendy Paulson, the U.S. 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

To change human attitudes towards birds of prey, especially Harpy Eagles, to reduce persecution and conserve their habitat.

The education program is an integral part of the Harpy Eagle Project. Because we have found that ignorance is the main cause behind human persecution, any restoration effort must be supported by environmental education using the Harpy Eagle as an icon for biodiversity conservation. The enthusiasm and understanding created by successful Harpy Eagle restoration will provide important positive reinforcement of the conservation message. People will see that all is not lost, and that biodiversity conservation can be achieved with easily seen, dramatic results focused on one of the most charismatic animals in the world. Together, Harpy Eagle restoration and environmental education form a powerful tool for the conservation of Neotropical forest biodiversity.

Our objective is to develop an environmental education program that will promote the conservation of the Harpy Eagle and its habitat, thereby enhancing biodiversity conservation in Panama and over time throughout the range of the eagle. Our educational program will profit from the species' value to Panama as the national bird and its importance in the cultures of many countries and peoples. Through our collaborative efforts with governmental and non-governmental organizations we hope to make the Harpy Eagle a symbol of environmental conservation and pride throughout its range in the Neotropics.

RESULTS

Cumulative: Our education program began in 2001 with a pilot project that consisted of identifying, visiting, and talking to people in communities adjacent to areas targeted for future releases of Harpy Eagles. An awareness campaign was started about the value of the species in the environment. A year after the campaign we interviewed 344 people from four communities in areas surrounding the release sites. The community with the highest number of people knowledgeable about Harpy Eagles was the one where our pilot education project began and where most of our activities occurred. This survey also showed that ignorance was the main reason why people kill Harpy Eagles. We found there was strong interest in participating in environmental education and other conservation activities. We also found there must be at least annual follow-up activities after the education campaigns are completed in rural communities, as well as after other educational activities in urban and rural sites, otherwise the enthusiasm, commitment, and support for conservation can diminish quickly. This kind of follow-up may need to occur annually for one generation (20-30 years) before it is sufficiently well incorporated in local culture and behavior.

2002: Among the results of the education program in 2002 was the development of an environmental education strategy and educational materials based on the pilot program and studies accomplished the year before. This strategy was implemented in communities of Alfajía, Limón, and Nueva Providencia, which are nearest our Harpy Eagle release site in the Panama Canal watershed, as well as within communities of Darién in eastern Panama.

One highlight of the year was the declaration of the Harpy Eagle as the national bird of Panama. Our staff brought our education Harpy Eagle for an up-close and personal meeting with Panama's Congressional delegates, which helped create new status and enhanced legal protection for the species.

Another highlight was the huge success of our Harpy Eagle naming contest among schools of Panama. School children were asked to name the first Harpy Eagles hatched in the NRC, providing a short essay about why they thought their choice of name most appropriate. Over 75 schools participated, with hundreds of entries that were judged by panelists from ANAM, USAID, ACP, Patronato de Amigos del Águila Arpía, Ecological Police, City of Knowledge, and Fondo Peregrino-Panamá. Ten winners were invited to a ceremony and to experience being "biologists for a day" by joining our staff in the field and laboratory.

FUTURE PLANS

As Harpy Eagle releases occur in more locations, such as Bocas del Toro in western Panama, our education program will expand accordingly, to include possible collaboration with the Belize Zoo for education efforts in Belize. To be effective, the education program will rely heavily on cooperation and partnerships with other governmental and non-governmental organizations willing to carry the same conservation message. In Panama, for example, we will provide educational material, information, and training to collaborating governmental and non-governmental organizations, such as the U.S. Peace Corps, who collectively reach a far greater audience than we could reach by ourselves. This project will result in the development of a public awareness and education curriculum using the Harpy Eagle as a flagship for conservation, especially for use around important release sites, but potentially throughout the country or region. We anticipate this work will have broad and lasting impact as the message and curriculum are adopted and used by other government and non-government organizations.

Ursula Valdez

Park Ranger Norberto Serrano, from Soberania National Park (ANAM), explaining the feeding behavior and biology of Harpy Eagles to two farmers from the Alfagía community.

Staff-This project is conducted by Jolanta de Villarreal, Kathia Herrera, and Marta Curti. Ursula Valdez made important contributions during 2002.

Cooperators-We collaborate with Autoridad Nacional del Ambiente (ANAM), Panama Canal Authority (ACP), Soberania, Chagres, and Camino de Cruces National Parks, Ecological Police, Tierras Colectivas Emberá y Wounaan, Comarca Emberá/Wounaan, Sociedad Audubon de Panamá; Autoridad de la Región Interoceánica (ARI), Smithsonian Tropical Research Institute (STRI), Asociación Pro Niños del Darién, Education Ministry (Environmental Education Division), U.S. Peace Corps, GreenCom, Proyecto Cerro Hoya-German Technical Cooperation (GTZ), Ecoforest, Summit Gardens, and Parque Metropolitano.

Financial support for this program was provided by the U.S. Agency for International Development (USAID), Wolf Creek Charitable Trust, and Hank and Wendy Paulson.

Harpy Eagle Conservation and Research

GOAL

To conserve Harpy Eagle populations through habitat conservation, reduction of human persecution, restoration of lost or depleted populations, and improved understanding of the eagle through research.

The Harpy Eagle is one of the largest and most powerful eagles in the world. It is the national bird of Panama and is represented in many cultures throughout the Americas. Harpy Eagles occurred formerly throughout much of the Neotropics but are now largely extirpated through much of Central America and Mexico. Loss of lowland forest habitat has the most profound effect on eagle populations, but shooting and other kinds of persecution are responsible for depleted populations where suitable habitat remains. As we correct these conditions, we can use captive breeding and release methods that we are developing to restore lost or depleted populations of Harpy Eagles.

The Harpy Eagle could be the first large Neotropical forest eagle for which a science-based management program is implemented. However, there are many gaps in our knowledge of this species. A better understanding of the survival rates, behavior, and movements of birds from newly hatched until the settlement of a territory as breeding pairs would greatly enhance the effectiveness of our restoration efforts, and help us better understand the most critical factors to maintain sustainable populations in natural and human-altered habitats.

The need to preserve large segments of forests for the conservation of Harpy Eagles will represent a significant contribution to the protection of Neotropical lowland forests, among the most species-rich habitats of the planet. The Harpy Eagle would therefore act as an umbrella species: by conserving it we are conserving biodiversity.

Neotropical Raptor Conservation Program

RESULTS

Propagation: Moving our three breeding pairs of Harpy Eagles from Boise to Panama had a profound effect on their productivity. We believe that the combined effect of unfiltered sunlight, temperature, and humidity, as well as quiet seclusion, contributed significantly to this improvement. Through combined natural and artificial incubation and recycling, the three pairs laid 18 fertile eggs and hatched 17 nestlings in 2002. The young were hatched and raised in captivity, including a period of "bonding" in specially designed chambers in close contact with an adult Harpy Eagle. All the nestlings survived to fledge. This astounding rate of production makes it possible to consider a full species restoration effort, most likely to be focused on the Mesoamerican Biological Corridor that stretches from Colombia in the south to southern Mexico.

Jack Stephens, jackstephensimages.com

Release: With the successful production of young Harpy Eagles at our Neotropical Raptor Center we resumed experimental releases in Soberiana National Park along the famous Pipeline Road, a favorite forest route for bird watchers. The process of releasing (hacking) Harpy Eagles can take six months or more and involves labor intensive tracking and observation of the young eagles to help ensure their survival in the wild. First the young eagles are placed in a hack box, a chamber built on top of a tower in the forest, where they become acclimated to their immediate surroundings for two to three weeks. Upon release, the birds are provided unlimited food to attract them to the area while allowing them freedom to roam, build strength and flight skills, and learn to hunt. Once eagles consistently hunt for themselves, food provisioning can stop. We plan to capture independent birds and translocate them to remote sites where human persecution is likely to be least and their chances for survival to breeding highest.

We released eight birds during 2002 and the remaining birds will be released in 2003 when they are old enough. The first translocations are expected to occur in 2003 into the Bocas del Toro region of western Panama. We are also exploring the possibility of conducting experimental releases in Belize where Harpy Eagles once occurred but are now very rare.

Research and Conservation: A better understanding of the survival rates, behavior, and movements of birds from newly hatched until the settlement of a territory as breeding pairs would greatly enhance the effectiveness of our restoration efforts, and help us better understand the most critical factors needed to sustain populations in natural and human-altered habitats. These studies have begun in Darien National Park where we have recruited members of the indigenous Emberá-Wounaan communities to assist. In 2002 we recruited seven parabiologists from local communities. Training has begun, surveys have been expanded, and long-term information collection begun in at least 15 active Harpy Eagle territories. Parabiologists were chosen because of their knowledge, leadership capacity, and ability to provide feedback to their communities in an effort to bolster local conservation results.

FUTURE PLANS

Captive propagation of Harpy Eagles in Panama has shown important results that suggest that a regional species restoration effort may be feasible. We will continue captive propagation efforts to determine whether the outstanding results of 2002 can be consistently achieved, while at the same time exploring possibilities for regional restoration of the Harpy Eagle in Central America. Experimental releases of

Staff-Harpy Eagle propagation is conducted by Nadia Sureda and Saskia Santamaría, food production by José de Los Santos López and Bolívar Rodíguez, and maintenance by Francisco Barrios, Noel Guerra, and Próspero Gaitán. Harpy Eagle releases are coordinated by Angel Muela and conducted by Marta Curti, Johana Cedeño, Humberto Fossatti, Félix Sandoval, Elsie Ashworth, and Bertrand Eliotout. Cal Sandfort provides overall direction for management of the captive eagle population, and Magaly Linares provides veterinary support.

The research component is conducted by José de Jesús Vargas and Emberá and Wounaan parabiologists Eloy Aripio, Dadildo Carpio, Bilomar Doviaza, Ernán Flaco, Rodolfo Mosquera, Gabriel Menguizama, and Rogelio Peña. Philippe Potuin assisted as a volunteer.

During 2002 Leo Salas directed the program, and Mia Jessen and Andrew Heath made important contributions.

Courtesy Neil Rettig Productions, Inc.

W. Perry Conway

Martin Gilbert

Harpy Eagles will continue, to include testing the concept of release at permanent release sites followed by translocation and re-release of fully independent birds in very remote localities. Harpy Eagle conservation and research efforts in Darien are in their infancy but show great promise for long-term conservation benefits. This effort is expected to be sustained for two or more decades to produce first-ever population biology results for such a long-lived, slow-reproducing species as the Harpy Eagle. ■

Opposite page: Green Heron. *Above:* Harpy Eagle and chick at nest.

Above right: Peregrine Fund biologist Kathia Herrera searches for Harpy Eagles in the rainforest of Panama. *Right:* Propagation Specialist Nadia Sureda and a hooded immature female Harpy Eagle.

Collaborators-The Harpy Eagle project depends on the partnership of many individuals and organizations, including the Autoridad del Canal de Panamá (ACP), Autoridad Nacional del Ambiente (ANAM), Autoridad de la Región Interoceánia (ARI), Fundación Ciudad del Saber, Patronato Amigos del Aguila Harpia, Smithsonian Tropical Research Institute, Asociación Nacional para la Conservación de la Naturaleza (ANCON), GreenCom, Ecological Police, Tierras Colectivas Emberá y Wounaan, Comarca Emberá/Wounaan, Soberania, Camino de Cruces, Chagres, and Darien National Parks, and Imprenta Pacífico-Clave 2.

Major financial support for this project was received from Wolf Creek Charitable Trust, Hank and Wendy Paulson, the U.S. Agency for International Development (USAID), the Charles Engelhard Foundation, The Walt Disney Company Foundation Conservation Awards, the Diane A. Ledder Charitable Trust, and Cemex.

Orange-breasted Falcon Project

GOAL

To understand 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.

The Orange-breasted Falcon has been the subject of field studies by The Peregrine Fund for over two decades, since Pete Jenny's first studies in 1978 in Ecuador and Guatemala. We have found this highly specialized falcon occurs at very low densities with a patchy distribution, most often in areas of exposed cliffs needed for nesting and intact tropical forest that supports their preferred prey. They reproduce at a slow rate, are non-migratory, and appear to be extremely sensitive to habitat change.

For various reasons, including habitat loss and fragmentation, and possibly environmental contamination, known populations are small and widely separated, and may be subject to the effects of genetic isolation, natural attrition, and random catastrophic events, such as a hurricane or disease epidemic. Yet the species' overall range from southern Mexico to northern Argentina suggests the potential, but still unknown extent, for a large population where suitable habitat remains. As such, Orange-breasted Falcons are of conservation concern in Central America and offer the opportunity to test conservation strategies such as restoration and bolstering of lost and depleted populations, and genetic enhancement of isolated populations.

Angel Muela

Above: Orange-breasted Falcon in its natural habitat.
Right: Our breeding facility for Orange-breasted Falcons at the Neotropical Raptor Center in Panama.

Cal Sandfort

RESULTS

Cumulative: Careful surveys and detailed observations from 1994 through 1997 identified a small population of Orange-breasted Falcons in Belize and Guatemala. Surveys throughout Central America from 1999 through 2001 revealed no Orange-breasted Falcons between Belize and the far eastern extent of Panama, a separation of some 900 miles. Two nestling falcons were collected from Panama in 2001 to begin our captive breeding stock.

2002: Four clutches each of three eggs were collected in the early incubation stages from four Orange-breasted Falcon eyries in Darien, Panama. All 12 eggs (100%) were successfully incubated, hatched, and the young raised at our Neotropical Raptor Center (NRC), representing a substantial improvement over observed hatch rates in the wild of only 18% at the same eyries in 2001. Nine birds were retained at the NRC in our state-of-the-art Orange-breasted Falcon breeding facility, while three were sent to research associate Robert Berry's breeding facility in Sheridan, Wyoming. We confirmed re-nesting and laying of a second clutch of eggs in the same season at three of the four eyries, and again observed a very low hatch rate of approximately 22% among them. Our actions therefore did not result in an apparent net loss to the wild population.

Field studies continued in Peru in an attempt to locate Orange-breasted Falcons in South America to assess their preferred habitat and estimate their numbers in this part of the species' range. Despite substantial search time and effort, only two possible breeding pairs were identified in cliff and lowland forest landscapes about 550 miles apart.

FUTURE PLANS

We aim to develop the methods and expertise to predictably breed Orange-breasted Falcons in captivity. This specialized bird- and bat-catching falcon is expected to present some new challenges, such as breeding chambers designed to accommodate their fast flight. To optimize our chances of success we are developing two captive breeding populations at separate locations. This may be accomplished in 2003 if we succeed in collecting four female birds, preferably from Belize, to maximize genetic diversity among the captive stock.

Field studies will be continued to determine the ecological factors that limit the species' distribution and abundance throughout its range, and investigate genetic variation within and between populations.

Staff-This project is conducted by Angel Muela, Nadia Sureda, and Saskia Santamaria. Cal Sandfort provides overall direction for captive propagation and Magaly Linares provides veterinary support. José de Los Santos López, Bolívar Rodríguez, Francisco Barrios, Noel Guerra, and Próspero Gaitán also provide assistance.

Mia Jessen and Andrew Heath made important contributions during 2002. Field work in Peru is conducted by Oscar Beingolea.

Cooperators-We collaborate in Panama with Autoridad Nacional del Ambiente (ANAM) and Comarca Emberá-Wounaan, and in Guatemala with Consejo Nacional de Áreas Protegidas (CONAP). Assistance was provided by Helipan Corporation, Piñas Bay Resorts, S.A., and Pantiacolla Lodge, Peru. Robert Berry is a research associate in development of captive breeding techniques for this falcon. Financial support was provided by Wolf Creek Charitable Trust.

West Indies Project

GOAL

To help prevent the extinction of raptors found only on the islands of the West Indies and conserve native habitats that are so important for migrating birds.

The West Indies form a sweeping 2,400 mile arc of islands that run east and south from Cuba to Grenada. The islands are a critical link in the migration routes of over 100 species of birds that breed in North America and winter in the south. They also support a number of species that are found only on the islands and are vulnerable to extinction because their habitat and range are so severely limited. The raptors found only on the West Indies islands of the Caribbean are no exception.

This project aims to conserve the rare and endangered raptors in this region by understanding their ecology, developing local capacity for conservation, and implementing interventions designed to protect habitat and species in jeopardy. We focus on the Grenada Hook-billed Kite, the Ridgway's Hawk in Dominican Republic, and the Cuban Kite and Gundlach's Hawk in Cuba.

In Grenada, we have conducted surveys throughout the island and found about 40 individual kites, some in areas from which they had not previously been reported. In 2000, we found two nesting pairs and two pairs exhibiting nesting behavior. In 2001, we found three pairs nesting, two of which provided the first evidence that kites nest in wet forest habitat. Surveys continued in 2002 with the involvement and training of a biologist from the Department of Forestry who will monitor the kites annually and search for nesting birds.

In Dominican Republic, the Ridgway's Hawk is a critically endangered and poorly known raptor. It appears to be confined now to the eastern part of the island in Los Haitises National Park. In 2000, we spent one week in and around this park and observed one bird inside the park and heard one bird in a forest fragment about 4 km from the park boundary. We returned in 2002 to complete more intensive surveys and train a local survey team.

Cuba is the largest of the islands in the Caribbean and supports a unique biodiversity. We are providing support and advice to two Cuban biologists to find and study the critically endangered and possibly extinct Cuban Kite, the poorly known Gundlach's Hawk, and to study the biology of Peregrine Falcons that breed on the island.

Russell Thorstrom

Russell Thorstrom

Left: Female Ridgway's Hawk perched near her nest.
Below: Edward Massiah (left) and Desmond McQueen observing a Grenada Hook-billed Kite nest.

RESULTS

In 2002 we conducted surveys on and monitored Grenada Hook-billed Kites during August and found two nesting pairs. In the three seasons of surveying and searching for kites we have located 13 pairs of which seven have attempted breeding. Grenadian biologist Desmond McQueen began searching for and monitoring kites in August and we will continue to support his efforts through 2003.

In Dominican Republic during February and March we surveyed for Ridgway's Hawks in the Los Haitises National Park. The limestone karst landscape of the park provides some safety and seclusion to the hawks, but makes our task of finding them to assess their numbers very difficult. We entered the park from both the ocean side on the northern boundary and from the island interior on the southern edge. We located 19 territorial pairs, of which five pairs attempted nesting, and three pairs were successful in fledging five young. We employed and trained two Los Haitises National Park guards, Juan Cespedes and Samuel Valbuena de la Rosa, to conduct searches for territorial pairs and nest sites on an ongoing basis.

In Cuba, we are supporting two Cuban biologists to conduct surveys and research on the Cuban Kite, Gundlach's Hawk, and nesting Peregrine Falcons. The Cuban Kite has not been observed reliably since 1996 and is considered by others to be near extinct. Four kite surveys of 12 days each were conducted in the eastern region of Cuba where the last sightings were made, but no kites were positively identified. The nesting site of Peregrine Falcons was checked during three weeks of July and August but no birds were found.

FUTURE PLANS

Surveys and ecological studies on the Ridgway's Hawk are planned to determine the species' population status and understand what factors limit their distribution and abundance within Dominican Republic. Potential factors that we will investigate include food sources and possible limitations. Evidence of persecution by people exists so we will collaborate with Fundacion Moscoso Puello, a non-governmental conservation organization in Dominican Republic, to begin awareness and education in communities around the national park to limit this cause of mortality.

Monitoring of the Grenada Hook-billed Kite population will continue until we have sufficient knowledge to determine the most effective conservation interventions for this species. In Cuba, our local partners will continue their surveys for Cuban Kites and research will begin on nesting Peregrine Falcons and Gundlach's Hawks as soon as breeding pairs are found.

Staff-This project is managed by Russell Thorstrom.
Collaborators-We work in partnership with Jesús Almonte of FMP, Inc. and Los Haitises National Park guards Juan Cespedes and Samuel Valbuena de la Rosa, Grenada Dry Forest Biodiversity Conservation Project, Grenada Forestry Department, Alan Joseph, Anthony Jeremiah, Michael Jessamy, Michael Philips, and Rolax Frederick. Independent researchers Edward Massiah from Barbados and Richard Gerhardt and Bonnie Rusk in the United States provided assistance and expertise. In Dominican Republic, we appreciate advice given by Jim Wiley of the United States Fish and Wildlife Service, and collaboration from the National Parks Department, Matilda Mota, Fundacíon Moscoso Puello, Andrés Ferrer, the Hispaniola Ornithological Society, Kate Wallace, and Eladio Fernández. Financial support for this project was provided by the United States Agency for International Development (USAID) and The Walt Disney Company Foundation Conservation Awards.

Pan-Africa Raptor Conservation Program

Ron Hartley

Red Breasted Sparrowhawk.

GOAL

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

The Pan-Africa Raptor Conservation Program covers conservation interventions and raptor research throughout Africa and its associated islands (the Ethiopian biogeographic region) and has been in existence as a program since 1990. Since beginning, this program has supported research and developed conservation capacity in Kenya, Ethiopia, Ivory Coast, Cape Verde, Madagascar, Zimbabwe, and South Africa. Over 25 students have been supported through M.Sc. and Ph.D. degrees. New information has been collected on 27 of the 89 diurnal raptors that occur in the region, and conservation interventions achieved for three of the 16 species listed as globally threatened.

■ RESULTS

Cape Verde Kite Project: Our goal in the Cape Verde islands is to help prevent the extinction of the Cape Verde Kite and promote the conservation of other raptors found only on the Cape Verde islands. Surveys for Cape Verde Red Kites in May through August 2001 located six individuals. We returned to Cape Verde in June 2002 and located a mixed group of Cape Verde and Black Kites on Maio Island. Five kites were captured and transferred by chartered aircraft to our temporary facility on Boavista Island until veterinary and export/import permits could be secured. They were flown to the United Kingdom on 20 September where they entered a quarantine facility for 30 days of isolation before transfer to the National Birds of Prey Centre where they are now under the care of Jemima Parry-Jones. Once in the hand, the kites were found to share characteristics of both Red Kites and Black Kites with substantial variation between individuals. It was clear from plumage and morphological measurements that none of the kites captured could be reliably identified as either Cape Verde or Black Kites and that molecular genetics will be needed to determine if and how these birds may be paired to breed and preserve the genes of Cape Verde Red Kites. Based on the results of the molecular genetics study, we may need to return to Cape Verde to trap additional Cape Verde Kites. We hope to conduct field studies on the kites of Cape Verde to better understand their movements and breeding behavior. Collectively, this information should assist us in assessing the needs and value of further conservation interventions.

Cape Vulture Project: We continued support of Pat Benson in South Africa for his long-term population study on the endangered Cape Vulture. He aims to use the knowledge gained to mitigate human impacts on the species' survival. The decline in the numbers of breeding pairs at the Kransberg vulture colony continued this season with 667 occupied sites from a high of 977 in 1984. Eggs were laid in 636 active sites, from which 393 nestlings fledged (58.9% of occupied sites and 61.8% of active sites). Despite the decline in number of occupied nests, this was the fifth highest number of nestlings fledged from this colony in the past 10 seasons (range = 257–472), and proportionally the highest number of fledglings per nest site known in the last 22 years. At least 455 active nest sites were monitored at Manutsa colony during the 2002/2003 nesting season, from which 303 nestlings fledged. The number of active nests has remained almost constant since detailed observations began in the 2000/2001 season. The number of fledglings per active nest site compared between the Manutsa and Kransberg colonies were similar. Monitoring of population size, breeding success, and mortality will be repeated at both colonies in the 2003/2004 season. Results will be presented at scientific meetings and published. Help will be provided to Marakele National Park to set up a public viewing site of the Kransberg colony with telescopes and information about the Cape Vultures and their conservation.

Bale Mountain Raptor Project, Ethiopia: In 2002 we provided a grant to Simon Thirgood, University of Stirling, United Kingdom, to begin a study of the unique raptor community of the Bale Mountains in Ethiopia. The Bale Mountains support a diverse assemblage of predators, including six species of *Aquila* eagles (Tawny, Steppe, Black, Golden, Lesser-spotted, and Greater-spotted Eagles) and the endangered Ethiopian Wolf. They depend on a high density, high mountain community of rodents for prey. Local pastoralists use the area, including Bale Mountain National Park, for grazing their livestock, which compete with these prey animals for forage and affect the predators through the food chain. The study will be of immediate value in planning conservation action for this unique and endangered ecosystem.

■ FUTURE PLANS

We hope to expand our research, conservation, and training opportunities to additional countries in Africa, ultimately to develop raptor conservation capacity throughout the continent and its islands. We also hope to develop a small grants program to help support valuable research and conservation projects by qualified individuals from Africa.

Please see the following five pages for further projects and results within this program. ■

Staff-Rick Watson directs the Pan-Africa Raptor Conservation Program, with assistance in Cape Verde from Sabine Hille, Jim Willmarth, Simon Thomsett, Andrew Heath, and Mia Jessen.
Cooperators-We collaborate with the National Birds of Prey Centre, United Kingdom, Cape Verde Ministry of Agriculture and Fisheries (Executive Secretariat for the Environment), Instituto Nacional de Investigação e Desenvolvimenta Agrário (INIDA), Cape Verde Project Natura 2000, University of the Witwatersrand, South Africa, University of Nottingham and University of Stirling, United Kingdom, and others listed with projects in the following pages. Important financial support comes from The Walt Disney Company Foundation Conservation Awards and Paul Tudor Jones, II.

Zimbabwe

GOAL

To develop local capacity for research and conservation of birds of prey through training, support, and hands-on conservation.

Ron Hartley

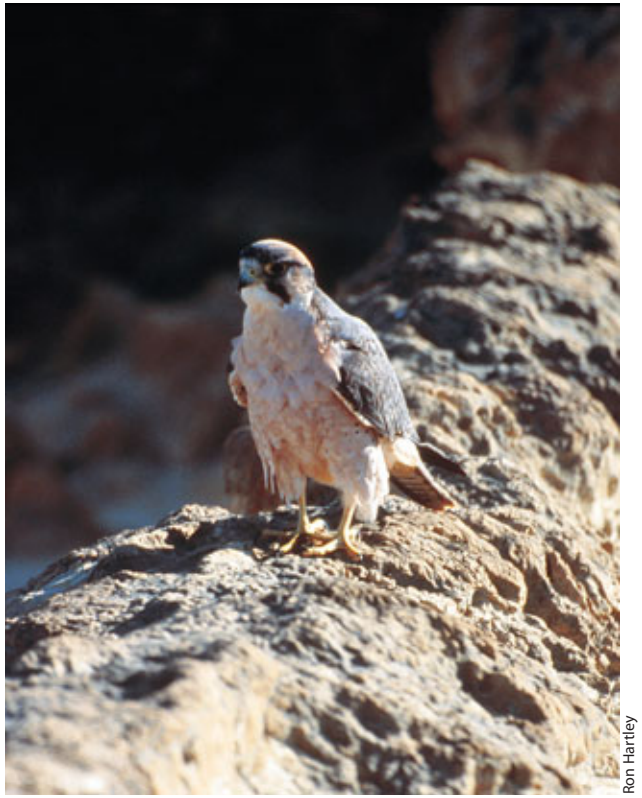
The Zimbabwe Project was one of The Peregrine Fund's first in Africa, begun in 1983 with a focus on the rare and little-known Teita Falcon. Our partnership with the Zimbabwe Falconers' Club (ZFC) has been the basis of our efforts in Zimbabwe. With a relatively small investment of financial support and technical expertise from The Peregrine Fund, the ZFC has become a significant leader in raptor conservation and research in the region. Much has been accomplished, including landmark investigations into the effect of DDT on the Peregrine Falcon and other raptors, the status and distribution of Teita, Peregrine, and Lanner Falcons, raptor community studies in Batoka Gorge, Save, Triangle, and Malilangwe Conservancies, Esigodini, and Matobo Hills, and training and local capacity development at high school and graduate levels.

RESULTS

Despite on-going political problems in Zimbabwe, a comprehensive program of raptor studies and monitoring was achieved in 2002. Our raptor community studies on privately owned wildlife conservancies have demonstrated the vital role of these areas in regional conservation strategies that are developing so-called "trans-frontier Peace Parks." Both the Malilangwe and Save Conservancy areas fall within the framework of the massive Kruger, Banhine-Zinave, and Gonarezhou Trans-frontier Park (95,712 km^2). Batoka Gorge is within the framework of the Four Corners Trans-frontier Park. Wildlife and wildlands constitute what is probably Zimbabwe's most valuable and unique resource. Conservation and multiple use of these resources has the potential to uplift local economies and the national conservation effort. Our work is improving public awareness of the need to conserve raptors properly in these areas and is fostering an understanding of their vital role in the ecology of these ecosystems.

Objectives of our raptor community studies are to identify the full diversity of raptors breeding and visiting the area, measure their breeding densities, identify their prey, and assess the factors that limit the species' distribution and abundance. Some of our studies involve long-term monitoring, such as at Esigodini where species such as Wahlberg's, African Hawk, and Martial Eagles have been studied since 1961. Studies have also continued on the biology of selected species, including Teita, Peregrine, and Lanner Falcons, Bat Hawk, Crowned Eagle, and Black, Ovambo, and Little Sparrowhawks. Some highlights include finding a particularly high density of Crowned Eagles—11 pairs in the 500 km^2 study area in the Save Conservancy, where nests were only 3.9 km apart; and finding 10 pairs of African Hawk Eagles and six pairs of Crowned Eagles among the rich diversity of raptors that inhabit 40 km^2 of hills in the Malilangwe Conservancy.

Publication of these studies and sharing information with stakeholders is an important goal of our program. The compilation and funding of a 140-page Special Edition of *Honeyguide* (*Journal of Birdlife Zimbabwe*) devoted entirely to the accomplishments of the ZFC and other scientific publications were achieved this year.



Ron Hartley

Left: Project manager Ron Hartley with supporter Paul Tudor Jones, II.
Above: Lanner Falcon.

Our project continues to be served well by ZFC and other volunteers who are, in turn, products of our training program. Training has been upgraded to include a certificate course in raptor field biology offered at Falcon College, and the launch in 2002 of a scout training program at Malilangwe.

FUTURE PLANS

In the short-term, we plan to continue the valuable studies and training that are currently in progress with emphasis on work in the Malilangwe Conservancy. The uncertainty caused by political and social upheaval in Zimbabwe makes it difficult to look far into the future of this project.

Staff-Ron Hartley manages the Zimbabwe Project.
Cooperators-We collaborate with the Zimbabwe Falconers' Club and the Zimbabwe Department of National Parks and Wild Life Management. Financial support for this project was provided by Paul Tudor Jones, II, Malilangwe Conservation Trust, David Maritz, and other important donors. Support was received in Zimbabwe from Dunlop Co., United Spring Co., Gorges Lodge, Mokore Safaris, Adrift Co., Triangle Ranch, Ltd., and Kwali Camp, Malilangwe.

Ron Hartley

The African Crowned Eagle, like the Harpy Eagle of the Neotropics and Philippine Eagle and New Guinea Harpy Eagle in the Asia Pacific, depends on intact tropical forest for survival.

East Africa Project

GOAL

To monitor populations of raptors at risk, understand their ecological needs, and develop scientifically sound conservation plans to ensure their survival, and develop local capacity to achieve results.

Africa's wild open spaces teem with a unique array of birds, mammals, and other wildlife whose survival is inextricably linked to a spectacular diversity of habitats. East Africa supports more than 80% of all bird species recorded in sub-Saharan Africa. This includes nearly 20% of the world's raptor species, three-quarters of which are considered poorly known, and the survival of many is in jeopardy. The human population in sub-Saharan Africa continues to expand at one of the world's highest rates, putting natural resources under severe pressure and dramatically altering ecosystems on which raptors depend. Ethnic strife and political instability, disease, poverty, desertification, and low literacy levels combine to create monumental conservation challenges for the 21st Century. Biologists must achieve conservation goals alongside human development to ensure sustainable results.

Simon Thomsett and Munir Virani have been conducting raptor research, training, education, and awareness programs since the inception of the project in 1992. Our primary goal is to monitor population trends of raptors at risk to provide a science-based warning of population declines in need of a conservation response. Our field studies on rare and threatened species enable us to develop rigorous conservation strategies. Throughout this work, we create opportunities for hands-on research, education, and training of students and others to develop local expertise and enthusiasm to ensure continuity in raptor biology and conservation of biodiversity.

RESULTS

Cumulative: Over the past decade we have increased knowledge about the population status and ecological requirements of the endangered Sokoke Scops Owl, Augur Buzzard, African Fish Eagle, Martial Eagle, Crowned Eagle, Teita Falcon, and Rüppell's, Egyptian, and Bearded Vultures. These studies have increased our skills to design and implement effective raptor research and monitoring programs in Kenya; fueled interest, enthusiasm, and awareness among students and local communities; and enabled us to develop a network and association with raptor biologists worldwide. We have supported and trained six students at M. Sc. and Ph.D. levels.

2002: Gyps vultures: The possibility of a potential disease spreading to vultures in Africa (see Asian Vulture Crisis Project) could have dire ecological consequences. In East Africa's savanna grasslands, vultures play a key role in consuming nearly 70% of large animals that die from disease or other causes. Our vulture research focused on population monitoring and hematological studies. We conducted aerial surveys at Mount Ololokwe in the Northern Frontier and Ol-Donyo Kwenia in the Rift Valley where we found populations of 125 and 153 Rüppell's Vultures, respectively. At Hell's Gate National Park, we monitored 23 occupied nests out of a population of 53 Rüppell's Vultures and measured breeding success of the species at 39%. We conducted the first-ever hemo-diagnostic study on African White-backed Vultures in Kenya. We trapped 14 vultures and collected blood to archive sera and examined 23 hemo-biochemical parameters that will form the baseline for future studies, essential in detecting a potential disease or contamination.

Sokoke Scops Owl: Using tiny (1.5 g) transmitters, we radio-tagged five Sokoke Scops Owls of which two were retraps that were first radio-tagged in 1993. This indicated that the owls were long-lived and that tagging had no negative impact on the bird's survival or behavior. By following a tagged female owl we discovered a possible nest of a Sokoke Scops Owl. Two days after release we found the bird perched on a tree. We found a cavity about six feet below the owl that was 3.5 inches in diameter with the rim lined with Sokoke Scops Owl feathers. Using a mirror we saw that the base of the cavity was lined with dry leaves but it contained no eggs or chicks. Unfortunately, upon tracking the bird a week later, we found that the owl had moved away and apparently abandoned the site. Thus, while we may have found the first nest of a Sokoke Scops Owl, we were unable to confirm the discovery.

African Fish Eagle: Kenya's Great Rift Valley is dotted by a series of freshwater and alkaline lakes supporting a rich avifauna. Understanding the population trends of the African Fish Eagles that depend on these lakes is an important way to measure the health of Kenya's changing Rift Valley lakes. These suffer from increased agricultural expansion, fluctuating water levels, shoreline degradation, sedimentation, and changes in water quality. Our aim is to

Ethnic strife and political instability, disease, poverty, desertification, and low literacy levels combine to create monumental conservation challenges for the 21st century.

Tony Crocetta

Munir Virani prepares to release an African Fish Eagle.

understand how populations of this aquatic predator adapt to natural and human changes affecting the lakes. This year we expanded efforts to band fish eagles at Lake Baringo to investigate survival and study inter-lake movements. The lake is home to an average of 35 individuals comprising 15 territorial pairs. The breeding performance of at least six resident pairs along a string of islands is dependent on local boatmen ferrying bird watchers who feed fish daily to the eagles as part of a community-based initiative. The lake's high turbidity from sedimentation impairs the fish eagles' ability to catch fish and may prevent them from reaching breeding condition. Feeding the eagles annually generates about US $150,000 in tourism revenue for the local community. We will continue our studies to investigate whether feeding fish eagles affects their behavior, breeding, and survival. Lake Naivasha's fish eagle population stands at approximately 100 individuals and is showing an upward trend following a two-year ban on fishing.

Athi River Raptor Facility: The facility at Game Ranching Athi River was expanded by construction of five breeding chambers for the Crowned Eagle and Bearded Vulture breeding projects. Organized school groups and wildlife students visit the facility for educational tours, and it was used in 2002 to house researchers studying vultures. The facility has played an important roll in exposing government authorities to raptor management techniques, and Simon Thomsett continues to provide advice and guidance to Kenya Wildlife Service (KWS) on issues of national concern that affect raptors to update and improve legislation.

Crowned Eagle: Over several years eight chicks have been bred and parent-reared in the Athi River Raptor Facility. This first-ever captive propagation project in East Africa has brought the importance of Crowned Eagle conservation to the attention of the relevant authorities and helped to prove the value of hands-on captive breeding and release as species restoration tools. Much of the success of the project depends on the KWS and staff of a nearby lodge who look after the eagles during release in Tsavo West National Park. Of five young eagles released, a leopard killed one male and a crocodile killed one female. The other three have survived to build nests and currently two show pair-bonding behavior.

Bearded Vulture: The cooperative project between Ethiopian and Kenyan governmental conservation organizations ended in 2001 after translocation and release of five Bearded Vultures into their former breeding site in Hell's Gate National Park. After release, two of the five birds died, one female was recaptured after threats were made against her life and now resides in captivity in a specially constructed breeding chamber, and two others, a male and a female, were seen in mid-2002 within 40 km of the site from which they were released, indicating a possible growing attachment to their natal area. Since then, work has focused on educating the public in those few locations in which Bearded Vultures are still found within Kenya. Education of local people, especially chiefs and school teachers, has had a positive effect with an increase in reports and concern. We are considering developing a small captive breeding project with locally taken Bearded Vultures. This will provide a slow but long-term recruitment of individuals into the wild. Because of the long-term nature of captive breeding, other partners have been approached to take up the responsibility of captive breeding if it is required.

Education, training, and awareness: We supported field studies of two Kenyan students this year. Catherine Gatome graduated with an M.Sc. in Wild Animal Health from the University of London. Festus Ihwagi is an M.Sc. candidate in Conservation Biology at the University of Nairobi. The Athi River Raptor Facility continues to contribute to education and training in which students and volunteers are exposed to wild and captive raptor management. We published a cover story entitled "Nest Quest" in East Africa's leading natural history magazine, *Swara,* that described our studies to find a Sokoke Scops Owl nest as well as depicting the deplorable state of Kenya's forests.

FUTURE PLANS

We will continue to monitor *Gyps* vulture and African Fish Eagle populations. We are committed to finding and describing the first-ever nest of the Sokoke Scops Owl, as we believe that this knowledge will add significantly to both the forest's and species' conservation and management. The Bearded Vulture project will continue to work towards a self-sustaining captive population from which birds will be released. A student will be identified to undertake an M.Sc. Degree in raptor biology in Kenya, and we will continue to encourage and support students in Ethiopia to work on the status of the Golden Eagle, *Gyps* vultures, and specifically the Eurasian Griffon Vulture. We hope to train and equip Tanzanian ornithologists in the method of raptor capture and tagging in a cross border project.

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 Services (KWS), Game Ranching Limited Athi River, Hell's Gate Management Committee, University of Leicester (United Kingdom), A Rocha, Nature Kenya, and the County Councils of Baringo and Koibatek. Important financial support was received from The Walt Disney Company Foundation Conservation Awards.

Russell Thorstrom

Radiotagged Madagascar Scops Owl of Masoala National Park perched at its daytime roost.

Madagascar Project

GOAL

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

The Peregrine Fund has worked in Madagascar since 1990 to help conserve some of the world's most endangered birds of prey and other fauna and flora that depend on habitats shared by people with these raptors. We have completed field studies on the endangered Madagascar Fish Eagle, which occupies wetland habitat on the western seaboard of the island. In response to conservation needs we pioneered the use of local community-based conservation in Madagascar to protect some of the country's last intact wetlands shared by fish eagles and indigenous Sakalava fishermen. This approach is now being used by others as a model for wetland conservation throughout the island.

In the last nine years, we have succeeded in rediscovering two raptors previously thought by some to be extinct, the Madagascar Red Owl and Madagascar Serpent Eagle. We have helped create Madagascar's largest national park to protect 210,000 ha (approximately half the size of Grand Canyon National Park) of rainforest habitat for these species on Masoala Peninsula and have provided expertise and training to establish avian monitoring in the park as a tool to measure the effects of park management on biodiversity.

One of our goals is to help develop local capacity for conservation and science by providing training and support to national Malagasy students and local people. We have supported 12 Malagasy students at M.Sc. and Ph.D. levels, three other students from the United States 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. Most of these students have completed and published studies on Malagasy raptors and other birds, fisheries, and lemur ecology. Many among this core group of educated and trained Malagasy personnel continue working in conservation and biodiversity, including for The Peregrine Fund. We support a Malagasy staff of 21 individuals that are key to the future of preserving Madagascar's natural heritage.

Pan-Africa Raptor Conservation Program

RESULTS

In the western central part of the country, where the Madagascar Fish Eagle and Wetlands Conservation Project is located, we are assisting in the legal transfer of control and management of natural resources from the Malagasy government to indigenous communities and their elected associations. The local communities have traditional practices that are good for conservation and their legal enforcement will help conserve habitat critical for the endangered Madagascar Fish Eagle. This project is pioneering the use of a 1996 law that empowers local communities to create resource management associations that are allowed to control and conserve wetland biodiversity at the same time as meeting sustenance needs of local people on a sustainable basis. In 2002, we assisted the associations in marking the boundary of the resource management areas that are under their control and jurisdiction. We provided material, equipment, and technical expertise for the associations to continue low-cost monitoring of fishery and forestry resources. We provided logistical, material, financial, and technical support for governmental forestry staff to visit and educate association members in operating a newly established tree and plant nursery. British student Ruth Tingay completed her field study on the breeding system of Madagascar Fish Eagles and is currently completing laboratory studies on the genetic relationships to identify paternity among offspring. In the same area we provided support to Malagasy M.Sc. student Tolojanahary Andriamala in his first field season studying the ecology of the Yellow-billed Kite in western Madagascar. He located six nests and is conducting his research from our field base camp on Lake Soamalipo.

Our second major project is in the rainforest of Masoala Peninsula in northeastern Madagascar. Our focus has been to achieve conservation and gather basic natural history and ecological information on endangered and poorly-known raptors. In October 2002, we located the third known nesting pair of Madagascar Serpent Eagles. The site was similar to nests we first described in 1997 and 2000, well concealed high in the forest canopy. Of interest, was the first evidence of a two-egg clutch and siblicide in this species. Both eggs hatched in November, but the second chick to hatch succumbed to its older sibling one week later. Both the adult female and remaining nestling were fitted with radio transmitters in December and have been followed several kilome-

Staff-Russell Thorstrom manages the Madagascar Project with Aristide Andrianarimisa, Lily-Arison René de Roland, Jeanneney Rabearivony, Jeanette Rajesy, and a staff of 21 in Madagascar (see staff list earlier in this report).

Cooperators-We collaborate with the Ministére des Eaux et Forêts (MEF/DEF), Minstére de l'Enseignement Supérieur (MinSup), Ministére de la Recherche Appliquée au Dévelopement (MRAD), Association pour la Gestion des Aires Protégées (ANGAP), Organization National pour l'Environnement (ONE), University of Antananarivo, United Nations Educational, Scientific and Cultural Organi-

ters south of the nest. This nesting pair also provided us with new information on their diet when small tenrecs, an insectivorous mammal, were captured and delivered as food to the nestling.

Aristide Andrianarimisa has been working steadily on a collaborative funding proposal to the Global Environment Facility (GEF) for western wetland conservation with nongovernmental organization partners Durrell Wildlife Conservation Institute, Wetlands International, and ZICOMA (BirdLife International partner in Madagascar). Aristide continues to provide leadership for the Ramsar Scientific Committee of Madagascar, participate in committees for implementation of community-based conservation projects, and provide instruction at the University of Antananarivo. Lily de Roland has continued avian monitoring on Masoala Peninsula in northeastern Madagascar and surveys for Madagascar Serpent Eagles in forest blocks in the eastern region. Dissemination of information through instruction and publication of results is a consistent goal of all our projects and resulted in 13 publications in 2002 and 191 publications since the project began.

FUTURE PLANS

The Madagascar Fish Eagle and Wetlands Conservation Project is assisting two community associations through their first three-year probationary period. We will continue to help the associations develop capacity for management of fishing and forest resource use so that they conclude their probationary period with success. We will provide logistical and material support, technical expertise, and education to the local associations to help manage the natural resources that they share with the fish eagles.

We will continue to provide research support to Masoala National Park. The expertise of our Malagasy staff is used to monitor avian communities to measure the impact of park management on conservation of biodiversity. We will continue our studies on Madagascar Serpent Eagles, providing new information about the species' natural history that is important for guiding conservation interventions in and around the park. We have also begun expanding surveys in remote lowland rainforest blocks to determine the distribution and status of serpent eagles throughout the eastern region of Madagascar.

Lily-Arison Rene de Roland

Left: Gilbert Razafimanjato assisting in the study of Yellow-billed Kites.

Russell Thorstrom

Jeanneney Rabearivony

Above: Short-legged Ground Roller of Masoala National Park ready to enter its nest.
Left: The Peregrine Fund staff and a local conservation association preparing documents for the fishing season.

zation (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.

Financial support for this project was provided by Conservation International-CEPF, Liz Claiborne and Art Ortenberg Foundation, The John D. and Catherine T. MacArthur Foundation, Wildlife Conservation Society, Ramsar Convention Bureau, Margaret Valentine, and several important individuals.

Mark Fuller/USGS

Mongolian student, Nyambayar Batbayar, measures a Cinereous Vulture nest.

Asia-Pacific Raptor Conservation Program

GOAL

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

The Asia-Pacific Program covers the Oriental and parts of the Australasian and Palearctic biogeographical regions. We currently focus on the most threatened species on the islands between the Pacific and Indian Oceans, the catastrophic decline of vultures in south Asia, and training in Mongolia where raptors are still relatively abundant.

RESULTS

New Guinea Harpy Eagle Project: The New Guinea Harpy Eagle is the largest forest predator in Papua New Guinea, yet remains little known. We began studies in 1998 when biologist Mark Watson spent 10 months mapping eagle territories in the eastern highlands. Since then we have supported Smith Asoyama and Amos Hatwara, two local guides trained by Mark, to locate and observe New Guinea Harpy Eagle nests. They visit known eagle territories monthly to assess breeding activity, and investigate reports from local villagers of eagle activity in new areas. As a result of their reports, biologist Martin Gilbert was able to gather valuable information on nest sites, behavior, and prey selection at two nests with recently fledged young. Feathers collected from the nests were used to determine that New Guinea Harpy Eagles, genus *Harpyopsis,* may be most closely related to hawk eagles of the genus *Spizeatus.* Smith and Amos continue to monitor known nests on a monthly basis and investigate reports of birds in new areas.

Mongolia Project: The main goal of this project, begun in 1999, is to develop local capacity for raptor conservation and research in Mongolia. As funds and time permit, we also hope to bolster the historical respect for birds of prey held by rural Mongolians by documenting Golden Eagle falconry techniques and publishing a book on the subject in local languages and English.

Mongolian student Nyambayar Batbayar was selected to receive training and support through his M.Sc. at Boise State University (BSU). He began work at BSU in 2000 with hands-on field training from our partners in the Snake River Field Station and others. In 2000 and 2001 he completed graduate level courses at BSU, and in February 2002 began his field studies on Cinereous Vultures in Mongolia. Little is known about this species in Mongolia where it is relatively abundant. Recent experience from the Asian Vulture Crisis Project has demonstrated the value of collecting baseline data on population parameters of even numerous species.

…we also hope to bolster the historical respect for birds of prey held by rural Mongolians by documenting Golden Eagle falconry techniques and publishing a book on the subject in local languages and English.

Nyamba located about 150 nests in three mountainous study areas of Central Mongolia, Bogdkhaan, Khustai, and Erdenesant. These sites are subject to different kinds of land use and provide an opportunity to learn about the effects of land use on vulture ecology. Nests were built on small bushes and trees as well as cliff ledges and boulders. First nests and eggs were found in late February when temperatures were still well below freezing. The first chick to hatch was found on 3 May. Several attempts were made to trap adult vultures, but only one was caught and tagged. Several nestlings were wing tagged once old enough and later, via Internet communications, reported from Korea by local biologists after migrating at least 2,000 miles.

Nyamba participated in the International Ornithological Congress (IOC) in Beijing, China, in August and then returned to Boise to complete additional graduate courses. He returned to Mongolia for a second season of field research in January 2003.

Philippine Eagle Project: The Philippine Eagle Foundation (PEF) is the primary organization working to conserve the Philippine Eagle and its environment. They accomplish this by employing an holistic action-oriented approach to conservation that includes: field research to learn more about the eagle and its environment; community-based initiatives to find long-term solutions to sustainable resource management by empowerment of impoverished human communities; conservation education to develop public awareness and understanding of the natural environment; and through captive breeding and other hands-on management of Philippine Eagles. The Peregrine Fund has provided technical and financial assistance to the PEF for over a decade and we encourage others to do likewise. For more information please contact the Philippine Eagle Foundation, VAL Learning Village, Ruby Street, Marfori Heights, Davao City 8000, phone (6382) 224-3041 and fax (6382) 224-3022.

Courtesy of F.R.E.E. Ltd.

Philippine Eagle.

FUTURE PLANS

In New Guinea we hope to find and support a student to be trained in techniques of raptor research. This student will work alongside Smith and Amos in the location and study of harpy eagles, providing a more constant effort and systematic approach to the study. Nyambayar Batbayar will complete his M.Sc. degree field studies in 2003 and graduate a year or two later.

Staff-Rick Watson directs this program which is conducted by Martin Gilbert and Munir Virani. Conservation associates Jim and Joyce Grier work closely with Bill Burnham and his co-workers on the Philippine Eagle project.

Collaborators-In New Guinea we collaborate with the Research and Conservation Foundation of Papua New Guinea, Wildlife Conservation Society, and the people of the Crater Mountain Wildlife Management Area. Important assistance was provided by Banak Gamui, Debbie Wright, and Andrew Mack. Genetic studies were done by David Mindell from Michigan State University.

In Mongolia we cooperate with World Wide Fund for Nature-Mongolia, Mongolian Academy of Sciences, Mark Fuller of USGS, Forest and Rangeland Ecosystem Science Center, Snake River Field Station, and Boise State University-Raptor Research Center. Support was provided by the Trust for Mutual Understanding.

Asian Vulture Crisis Project

GOAL

To intervene in the threatening extinction of *Gyps* vulture populations across the Indian sub-continent by finding the cause of kidney failure and gout-associated mortalities and developing a scientifically rigorous recovery plan.

The Peregrine Fund began working in the south Asian countries of Pakistan, India, and Nepal in 2000 following startling reports that the vultures of the region had been dying in massive numbers. As recently as the 1980s one of the species affected, the Oriental White-backed Vulture, had been considered to be possibly the most abundant large raptor in the world, yet by 2000 this species' population appeared to have dwindled to nothing over large areas of its former range. Three species of Asian vultures are now considered to be critically endangered, with possible extinction projected in less than five years. Declines of this magnitude in once common species have not been seen since the extinction of the Great Auk, or the Passenger Pigeon in the 19th century. The rapidity with which these declines have taken place may be without precedence, and the possibility that an infectious or toxic agent could completely wipe out a species of such abundance has implications that reach across the conservation world.

Asia-Pacific Raptor Conservation Program

Our aim is to establish the identity of the agent responsible for the devastating losses that have been observed across the region, and to develop a workable conservation strategy to ensure that remaining populations do not fall below sustainable levels. Our approach has followed parallel lines of enquiry in the field and in the laboratory. We continue to work in collaboration with the Ornithological Society of Pakistan and Bird Conservation Nepal, training local biologists in techniques of field ecology, post mortem examination, and in the handling of tissue samples. Through our intensive and continual efforts at vulture colonies we have been able to produce the first hard figures describing vulture mortality rates and patterns, and productivity. Our diagnostic efforts have been carried out in specialist facilities across the United States, with the involvement of veterinary experts in avian and wildlife disease, pathology, microbiology, and toxicology.

Munir Virani

Staff-This project is conducted by Munir Virani, Martin Gilbert, and Asim Muhammad.
Collaborators-We are working in partnership with J. Lindsay Oaks, Washington State University; Patrick Benson, University of the Witwatersrand; Ornithological Society of Pakistan; and Bird Conservation Nepal–Himalayan Nature. We depend on the collaboration and support of many other organizations and individuals, including the Punjab Department of Wildlife and Parks, Lahore Zoo, National Council for the Conservation of Wildlife, B.Z. Multan University, University of Agriculture at Faisalabad, Sind Wildlife

RESULTS

In Pakistan the situation has become very serious indeed. Numbers of breeding vultures have fallen dramatically at each of our three study colonies since we began work in 2000, with declines of 33%, 88%, and 97% over an area of at least 10,000 sq mi. We have found 1,366 dead vultures over two years in the field, with birds dying at a rate that is unsustainable and shows no sign of slowing. Our field staff and students have worked tirelessly, and have now completed post mortem examinations of 335 dead vultures. Ninety percent of adult vultures examined have shown signs of kidney failure, indicated by a white paste-like deposit of uric acid that coats the liver, heart, and other internal organs.

The diagnostic investigation is being coordinated by J. Lindsay Oaks, an avian microbiologist at Washington State University in Pullman. Tissue samples from 56 dead vultures have now been exported from Pakistan for analysis in U.S. laboratories. Tissue samples have been tested for the toxins and infectious agents known to cause kidney failure in birds. Histopathology sections have been distributed to specialist avian pathologists throughout the country, including the Zoological Society of San Diego, California; National Wildlife Health Center, Wisconsin; The Raptor Center, Michigan; UC Davis, California; and others. Results confirm that the vulture mortality is not related to infectious or toxic agents known to be involved in kidney failure in birds. Our analyses have ruled out the involvement of organochlorine pesticides (DDD, DDE, and DDT), and acute toxicity from organophosphates or carbamates. A previously undescribed mycoplasma species (a type of bacterium) was identified in roughly half of the vultures sampled, but was determined to be non-pathogenic, and unrelated to the kidney failure. We must now consider that the agent or process responsible for the death of Asia's vultures is either entirely new to science, or is a more familiar chemical or infectious agent that has affected the birds in a very unusual way.

In India, The Peregrine Fund researchers, Munir Virani and Martin Gilbert, surveyed vultures across seven states to gain a picture of the situation facing the country's vultures five years after the first reports of deaths began to emerge. As in Pakistan and Nepal, the Oriental White-backed Vulture appears to have been very badly affected with only small numbers of birds seen in the sites visited. Signs of dead vultures were found in several areas, although none were fresh enough to allow the cause of death to be established. But there was some room for optimism. Relatively large populations of Cliff Vultures, another species reported to have been affected, were encountered in several sites, with 106 active nests found in two of the seven states surveyed. This suggests that the outlook for this species may not be as bleak as had previously been thought. Further work is definitely required, and a return trip focusing on India's Cliff Vulture populations has been planned for March 2003.

Our partner in Nepal, Bird Conservation Nepal, continued to monitor vulture breeding sites in the Koshi Tappu Wildlife Reserve in the eastern lowlands of the country about 850 miles southeast of our study area in Pakistan. The surveys revealed that the Oriental White-backed Vulture breeding population in this area has declined to just six nests, a reduction of 90% over just two years. On a more positive note, increased efforts to establish a baseline of information on the Himalayan Vulture in their remote mountain breeding areas were rewarded with the location of 44 nests in 2002. Almost a fifth of all Himalayan Vultures recorded during the survey were juveniles, suggesting a healthy breeding population.

FUTURE PLANS

With the devastating losses we are recording across such a wide geographical area of South Asia, we must seriously consider the possibility that remaining vulture colonies could be completely lost in the near future. In the year ahead our diagnostic efforts will focus on the isolation of suspect viruses using specialized growth media, and the identification of agricultural chemicals and drug residues in vulture tissues. However, with potential extinction looming ever more prominently we must consider the possibility that insufficient time remains for us to establish a firm diagnosis before it is too late. We are now considering emergency measures to prevent the total extinction of South Asian vultures, including the establishment of a bio-secure captive flock. Should wild populations continue their decline below sustainable levels, then a captive flock could be used as a breeding pool from which to base a captive breeding and release program. Efforts will continue at the field sites to determine whether vulture populations may recover independently.

Three species of Asian vultures are now considered to be critically endangered, with possible extinction projected in less than five years.

Munir Virani

Opposite: The Bhandavgargh National Park in central India provides nesting cliffs for endangered Cliff Vultures *Gyps indicus,* and serves as a refuge for many other species such as the Asiatic Elephant.
Above: A variety of other animals share the Asian ecosystem, including this Bengal Tiger.

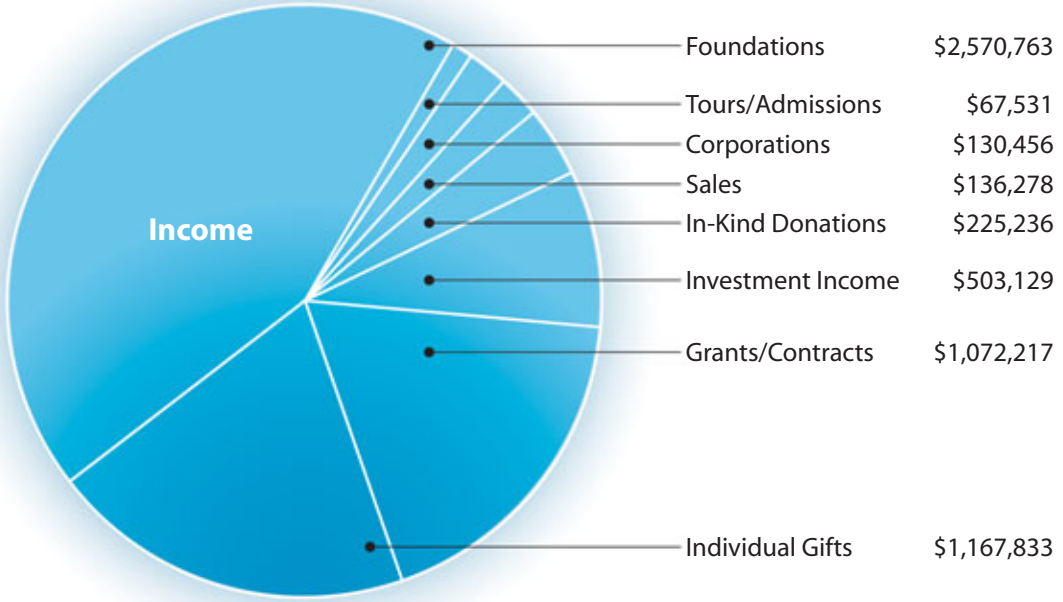
Management Board, Zoological Survey Department Pakistan, World Wide Fund for Nature (WWF-Pakistan), and Pakistan Museum of Natural History. In Nepal, we collaborate with Koshi Camp and Department of National Parks and Wildlife Conservation. In the United States we collaborate with the Zoological Society of San Diego, The Raptor Center, University of Minnesota, and the Bodega Bay Institute.

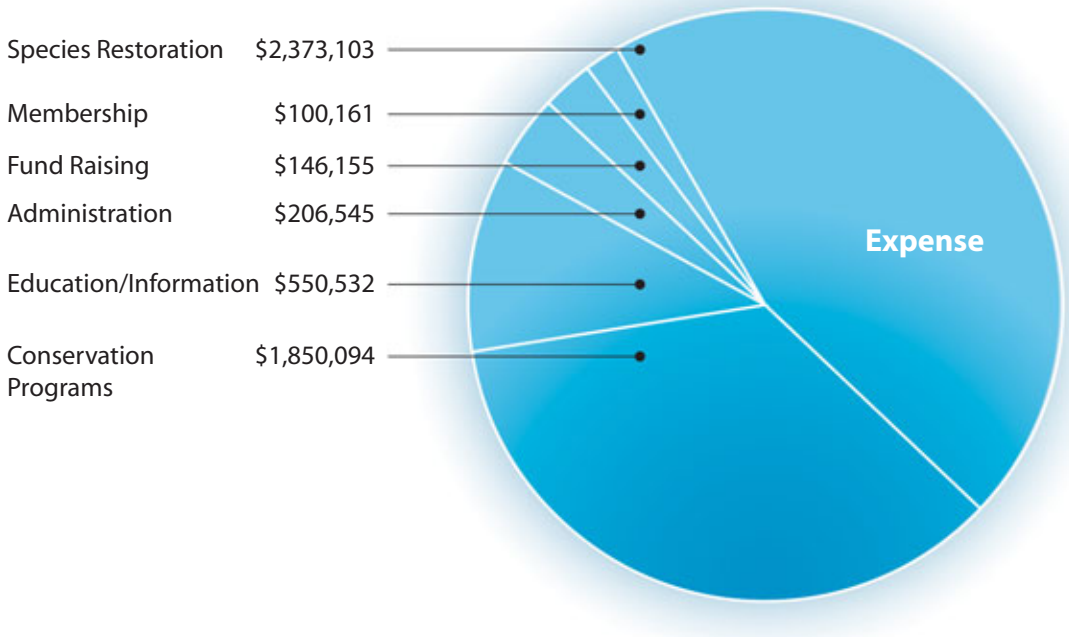
Important financial support was provided by the Gordon and Betty Moore Foundation, The Walt Disney Company Foundation Conservation Awards, and The Summit Foundation.

Balance Sheets • 30 September 2002 and 2001

ASSETS	2002	2001
CURRENT ASSETS		
Cash and cash equivalents	$ 289,792	$ 1,402,464
Merchandise inventory	34,669	37,440
Grants receivable	191,683	50,000
Pledges and other accounts receivable	549,746	235,012
Prepaids and other current assets	46,696	37,572
TOTAL CURRENT ASSETS	1,112,586	1,762,488
PROPERTY, EQUIPMENT AND ARCHIVES		
Land	1,513,000	1,513,000
Land improvements	719,944	758,881
Buildings	3,831,952	6,417,766
Trailers	168,690	150,123
Equipment and vehicles	1,479,360	1,283,210
Fixtures and displays	653,301	618,840
Construction in progress	29,132	21,865
	8,395,379	10,763,685
Accumulated depreciation	(3,179,225)	(3,300,722)
	5,216,154	7,462,963
Library	379,283	266,229
Archives	663,040	653,140
	6,258,477	8,382,332
ENDOWMENT ASSETS		
Cash	35,012	21,893
Investments	7,018,126	7,514,514
	7,053,138	7,536,407
	$ 14,424,201	$ 17,681,227

LIABILITIES & FUND BALANCES	2002	2001
CURRENT LIABILITIES		
Accounts Payable	$ 93,135	$ 80,484
Accrued taxes and expenses	8,744	804
Deferred restricted revenue	66,361	744,434
TOTAL CURRENT LIABILITIES	168,240	825,722
FUND BALANCES		
Unrestricted operating fund	944,346	936,766
Restricted endowment fund	7,053,138	7,536,407
Investment in property, equipment and archives	6,258,477	8,382,332
TOTAL FUND BALANCES	14,424,201	17,681,227
	$ 14,424,201	$ 17,681,227





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.

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 2002. 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.

$20,000 or more

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If you do not find your name, or find it in an inappropriate location or incorrectly spelled, please let us know. Accuracy is very important to us and although we try hard, sometimes mistakes slip by.

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We are pleased to honor this year's Chairman's Circle members. Their unrestricted gifts allow flexible response to changing circumstances and are critical to the organization's operation.

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The Chairman's Circle offers memberships at the Premiere ($5,000), Patron ($2,500), and Partner ($1,000) levels of unrestricted annual gifts. If you would like more information on the Chairman's Circle, please call our membership office at (208) 362-3716.

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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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