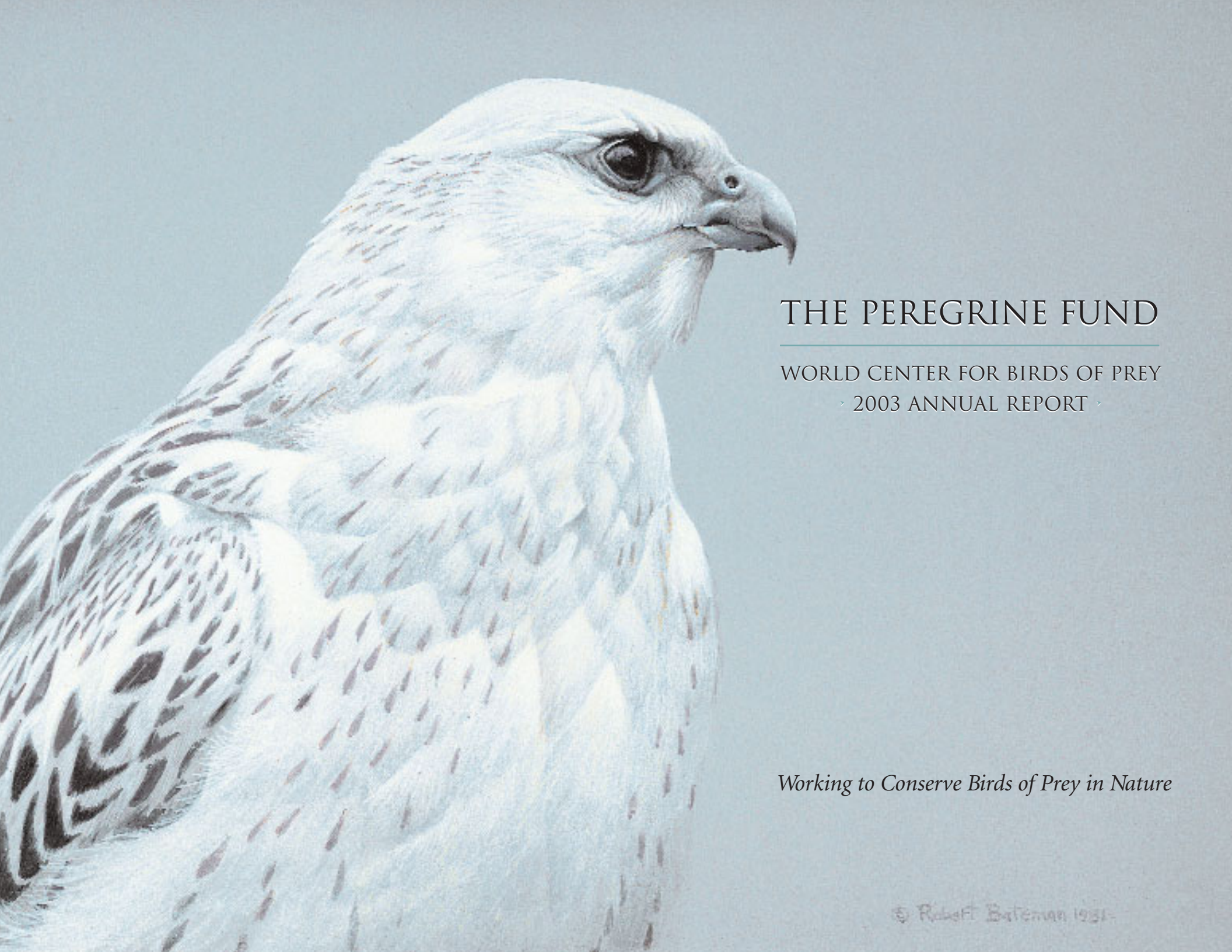

THE PEREGRINE FUND

WORLD CENTER FOR BIRDS OF PREY

2003 ANNUAL REPORT

Working to Conserve Birds of Prey in Nature

2003 ANNUAL REPORT


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Sumiya Ganchuluun


Ron Hartley

The Peregrine Fund Staff

The organization's business-related activities are supported by Pat Burnham (Administrator), Carol Pettersen and Donna Daniels (Bookkeepers), and Sherri Haley (Secretary/Receptionist). Linda Behrman is our Membership Director and manages our website. Amy Siedenstrang is our Art Director.

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Letter from the President

On 18 May 1984, under a bright blue sky and courting Long-billed Curlews, we dedicated the site for construction of the World Center for Birds of Prey. A long list of dignitaries spoke of the importance of the event and the hope for resulting future achievements. That day marked the transition of The Peregrine Fund from a transient organization existing only for as long as required to restore wild populations of Peregrine Falcons in the United States to an organization intent on becoming a perpetual global force in raptor conservation and research.

Jack Cafferty

File photo

The World Center for Birds of Prey in 1984 (left) and in 2003 (above).

The spring of 2004 is the 20th anniversary of that Boise, Idaho, facility, the World Center for Birds of Prey. Over the years the facility has continued to grow in size and scope, as has the organization. The Peregrine Fund is more than this facility, it is a team of staff, Board, cooperators, and donors who achieve results around the world. Having a proper organizational headquarters and home has been very important. Beyond providing a place where dedicated and highly motivated people can work and plan, the facility made it possible for development of a public education program, the captive breeding of birds of prey for release to the wild, establishment of a top-flight research library and one-of-a-kind falconry archives, and much more. Considering all that has been accomplished during the first 20 years in Boise, we look to the coming decades with the same determination and commitment to conservation of birds of prey. At right are listed some of the dates and highlights that occurred at the Center.

Sincerely yours,

Bill Burnham
President

WORLD CENTER FOR BIRDS OF PREY

20

TWENTY-YEAR ANNIVERSARY

1984-2004 • BOISE, IDAHO

Select Special Events and Dates at the World Center for Birds of Prey

1984 began construction of the World Center and consolidated the Ft. Collins, Colorado, facility there

1985 consolidated the Cornell University raptors to the World Center

1986 established the Archives of American Falconry at the World Center

1986 constructed the Gerald D. and Kathryn Swim Herrick Tropical Raptor Building

1990 paved the road and constructed a proper entrance to the World Center

1992 constructed the Velma Morrison Interpretive Center

1993 constructed the Peter and Conni Pfendler California Condor Facility

1995 expanded the World Center property to 580 acres

1999 hosted the Peregrine delisting ceremony and celebration at the World Center

2002 constructed the Gerald D. and Kathryn S. Herrick Collections Building

Construction totals 106,000 sq ft at the World Center.

Northern Aplomado Falcon Restoration

GOAL

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.

The Northern Aplomado Falcon is a species intimately associated with the grassland savannas of the American Southwest. Fairly common at the beginning of the 20th Century, this beautiful falcon had all but disappeared by 1930. Aplomado Falcon eggs, like the eggs of other falcon species, were highly prized by egg collectors because of their beauty and comparative rarity, and it is from their records that we have been able to glean the best information concerning the former population size and distribution of this species.

While there remains some debate over the exact cause or causes for their decline, perhaps the most plausible is the widespread changes which swept the falcon's grassland habitat. In South Texas much of the vast savanna known as the "Wild Horse Desert" was converted into farmland or became choked with mesquite. To the west in West Texas, New Mexico, Arizona, and northern Mexico, drought and overgrazing may have significantly reduced the number and variety of small grassland birds upon which the falcon preyed.

Erin Gott

Paul Juergens completing construction of an Aplomado Falcon nesting site. The barred box allows for falcons to pass through but not potential predators such as Great Horned Owls.

The Peregrine Fund began working with the Aplomado Falcon in 1978. A captive-breeding flock was developed from 25 wild nestlings collected in Veracruz, Tabasco, Campeche, and Chiapas, Mexico. The propagation of this species remains challenging, highly technical, and labor intensive, with over half the production the result of artificial insemination. In spite of these challenges, a total of 892 captive-bred falcons have been released in Texas, resulting in the formation of at least 39 pairs, where prior to 1995 there were none. Moreover, these pairs are now beginning to breed, and have successfully fledged more than 125 young.

Releases have occurred on Laguna Atascosa, Matagorda Island, and Aransas National Wildlife Refuges (NWR), and on private property. Our experience with the Aplomado Falcon has shown that habitat descriptions gleaned from historical sources were often quite different from that of the contemporary habitats selected by the released falcons. For the Aplomado Falcon, "historical" habitat and "suitable" habitat may be very different in contemporary landscapes.

2003 RESULTS

During the spring and summer of 2003 we released 80 young falcons at two sites in coastal South Texas, and at three sites in West Texas. Thirty-two falcons were released in South Texas with a success rate of 88%, and 48 were released in West Texas with a success rate of 75%. The combined success rate for falcons released was 77%, and represents one of the best years to date. We consider a bird to be successfully released 21 days after release, when it is no longer dependent on food provided at the release site. Falcons were lost due to premature dispersal, and as a result of predation by raccoons, coyotes, Crested Caracaras, Great Horned Owls, and Chihuahuan Ravens. We experimented with releasing as many as 20 falcons from a single site on South Padre Island in an effort to increase the efficiency of our release effort. This experiment was highly successful with 100% of the falcons reaching independence.

Three additional properties totaling 112,854 acres have been enrolled in the Aplomado Falcon Safe Harbor Program. The total habitat on private property currently enrolled is approximately 1,508,098 acres, or 2,356 square miles.

The Peregrine Fund biologists located some 39 pairs of Aplomado Falcons in South Texas and adjacent Taumalipas, Mexico. This represents a 5% increase over 2002. We located 26 pairs in and around the Laguna Atascosa NWR, and 13 pairs on Matagorda Island NWR. Thirty-two pairs (82%) made 37 nest attempts. Sixteen nests failed (50%) and five pairs re-nested (16%). At least 37 young were successfully fledged, up 16% from 2002. Nests were located in a variety of structures, man-made, abandoned nests of other species, and directly on the ground. As in previous years, raccoons, coyotes, Great Horned Owls, and Crested Caracaras represented a significant source of nest failure. Of particular note in 2003 were pairs of falcons that were able to fledge young successfully on Matagorda Island and on Laguna Atascosa National Wildlife Refuge from newly designed artificial nesting structures that limit access to predators. These pairs had never been successful prior to their use of these new artificial nests.

A paper has been accepted by the Wildlife Society Bulletin chronicling accomplishments achieved over the last 10 years.

A solid understanding of the Aplomado Falcon population in Texas is essential to the success of this recovery effort. Information on mortality rate, turnover rate, pair fidelity, age of first breeding, and dispersal patterns is needed to predict the long-term population dynamics of this developing population. The only way to obtain this information is to identify as many individual birds as possible by reading the small numbers engraved on their aluminum U. S. Fish and Wildlife Service bands. Although such reading is extremely difficult and time consuming, we are pleased to report that, of the 86 falcons observed, our field crew was able to read the band numbers on 75 individuals. This represents an impressive 87% of the observed population. These data, combined with the 65 individuals identified last year, will help us understand the dynamics and population structure of this developing population.

The Peregrine Fund has also been studying a population of 35 pairs of Aplomado Falcons in Chihuahua, Mexico, for the past decade. During the 2003 season our biologists, in cooperation with Alberto Lafon of Universidad Autonoma de Chihuahua, monitored 25 Aplomado Falcon territories. To determine change in the falcon's prey base we continued monitoring grassland bird population trends within the study site. Falcon production was 1.04 fledglings per occupied territory. Over the previous seven years, an average of 0.86 young fledging per occupied territory had been observed. Master's student Alberto Macias-Duarte completed his thesis. This paper suggests a relationship between habitat, falcon prey abundance, rainfall, and falcon productivity. We also continued our work with local ranchers installing wildlife escape ramps in stock tanks, thereby minimizing possible falcon drowning.

FUTURE PLANS

We will continue to release Aplomado Falcons in both South and West Texas in 2004 and closely monitor the developing populations in Texas. Addled eggs and tissue samples will be collected, when available, and analyzed for contaminant levels. Predation represents a significant impact on both the release effort and on the nesting success of pairs as they become established. We need to continue to develop innovative techniques to reduce both nestling mortality and increase fledging success. We believe the release of Aplomado Falcons and the subsequent establishment of wild populations in New Mexico to be biologically feasible. There are, however, non-biological challenges to be overcome before that can happen. Unfortunately, the Safe Harbor, which has worked so effectively to provide habitat for the Aplomado Falcon recovery in Texas, cannot be used significantly in New Mexico owing to the large percentage of public lands where the Safe Harbor does not apply. We are, however, working closely with federal and state government representatives to develop an experimental non-essential population designation for the Aplomado Falcon under section 10(j) of the Endangered Species Act for New Mexico and Arizona.

Adult Aplomado Falcon.

Cal Sandfort

Staff

Program Direction, Peter Jenny; Coordination, Bill Heinrich; Captive Breeding, Cal Sandfort, Emma Christensen, and Travis Rosenberry; Senior Scientist, Grainger Hunt; Field Biologists: Brian Mutch, Angel Montoya, Erin Gott, Paul Juergens, Jessi Brown, and Alberto Macias; Veterinary Support, Bruce Rideout; Hack Site Attendants: Chris Cattau, Joe Etheridge, Kerry Hosken, Hilary Huber, Erica LaMare, Rachel Joy Rabinovitz, Rachel Richardson, Lee Rindlisbacher, Dianne Scherer, and Kelly Wicks.

Cooperators

We cooperate with the U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, Arizona Department of Fish and Game, New Mexico Department of Game and Fish, Department of Defense, Bureau of Land Management, T and E., Inc., the Secretaria De Medio Ambiente Recursos Naturales Y Pesca (SEMARNAP), Universidad Autonoma de Chihuahua, Miguel Mora of the Columbia Environmental Research Center BRD/USGS, and receive support from many partners from the private sector.

Providing essential financial and/or logistical support were the Lee and Ramona Bass Foundation, Texas Parks and Wildlife Department, Ruth O. Mutch, Houston Endowment, Inc., The Brown Foundation, Inc., Robert J. and Helen C. Kleberg Foundation, EXXON/Mobil Corporation, Grasslans Foundation, Dallas Foundation, Sand County Foundation, William J. J. Gordon Family Trust, T & E, Inc., Karen and Tim Hixon, Burlington Resources, The Timken Family Charitable Trust, World Wildlife Fund, Joan and Herb Kelleher Charitable Foundation, Mr. and Mrs. Charles Price, The Tapeats Fund, American Electric Power, Mike and Carolyn Maples, The Frederic C. Hamilton Family Foundation, The Rosewood Foundation, Pete Davidson, and the University of Nevada, Reno.

California Condor Program

GOAL

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

Chris Parish

Chris Parish

Above: Wild-produced immature condor (left) with parent.
Below: Condors soaring skyward in the Grand Canyon—a sight thousands of visitors annually enjoy.

It finally happened in 2003. On 5 November the first young condor was successfully fledged by a captive-produced pair of condors, and it occurred in the Grand Canyon. It had been two decades since the last young condor fledged in the wild. Since 2001 there has been a total of 12 nesting attempts in the wild by captive-produced condors with eggs laid, six in Arizona with one known young produced and six in California with five young hatched but none successfully fledged. At year's end the total population of California Condors was 215, with 131 in captivity and 84 in the wild. This may be the last year that the captive population outnumbers the wild one. We are now using satellite telemetry with Global Positioning System (GPS) capability to monitor released condors with impressive results. The Arizona condors are still continuing to find an abundance of food on their own and all of the condors, with the exception of the wild young produced in Arizona, have been inoculated for West Nile Virus. We are also beginning to understand how condors are obtaining lead in their diets.

FURTHER RESULTS

A total of 18 young condors produced at the World Center for Birds of Prey over the past two breeding seasons were sent to our release site above the Vermilion Cliffs. The first group of eight arrived on 18 January and the second group of 10 on 19 December, bringing the total number of condors in Arizona to 51. The first eight birds were released in four small groups throughout the year. Since our first release in 1996 we have experienced a total of 23 fatalities.

This year only one bird was lost, five-year-old condor 198 was found dead near Zion National Park, and post mortem results came up inconclusive as to cause of death.

Courtship and egg laying increased again this year and by the end of February 2004 a total of 14 condors were engaged in courtship activity. There were three nesting attempts in which eggs were laid in 2003, one on the Vermilion Cliffs and two in Grand Canyon National Park.

Two attempts failed but the new site in the park was a success in every way. Male condor 123 and female 127, which had unsuccessfully nested at the Dana Butte site last year, moved to a new location downstream. The site was difficult to access, requiring a 12-mile hike just to make observations. A nestling was first spotted on 16 August. Without any human intervention the young condor successfully fledged on 5 November and has been doing well ever since. For more details please see The Peregrine Fund Newsletter Number 34 and visit "Notes from the Field" at www.peregrinefund.org.

The release program of California Condors in northern Arizona is centered near the Grand Canyon, an immense and rugged area of limited access. The current free-flying population of condors has shown an increasing tendency for long-distance movement within a range now extending northward to Zion National Park in Utah. Radio-tracking has proven essential to the well-being of these birds, particularly those newly released, because of the risks associated with human encounters and environmental contaminants. The trend toward wider movement, however, has made difficult the task of close monitoring with conventional VHF telemetry and ground tracking. In anticipation of this problem, we experimented with standard satellite-monitored radio-transmitters (PTT). While useful, the fixes triangulated by the satellites are of low precision and therefore of limited value. We therefore pursued the development of satellite-based transmitters that report far more precise GPS fixes. Working closely with the manufacturer, Microwave Telemetry, Inc., we were able to help design a transmitter that substituted perfectly in both shape and weight for the time-proven VHF transmitters. Condors that once carried two VHF transmitters (one on each patagium for redundancy) are now fitted with a PTT/GPS on one patagium and a VHF radio on the other for ground tracking.

We attached the first six PTT/GPS transmitters in winter 2003-04 and will soon apply more. Every evening we receive an e-mail containing GPS data from the Argos satellite system with locational fixes.

The resulting locations and movements of the condors are superimposed electronically on an array of standard topographical maps depicting the region. The solar-powered transmitters are designed to obtain a GPS fix every hour throughout the day. A reported fix at 11 a.m. may be received and decoded by our biologists at about 6 p.m. the same day. This timely access to movement information by a remote system is of great advantage to field management. Moreover, the technology promises to reveal the details of long-range movements and the use of areas and habitats heretofore unknown. Our hope and intention is to increase the number of these very useful transmitters.

We continued to trap all of the condors every six months to replace transmitters and take blood samples to monitor for lead. In addition, in 2003 we captured all free-flying condors in Arizona for West Nile Virus vaccinations during July and August. After the wild condors were vaccinated all of the captive birds at the World Center were treated as well. As a result of this abnormally timed capture we found evidence of 13 cases of lead exposure resulting in five chelations for lead toxicity. Two of the condors requiring treatment (condors 203 and 235) were observed feeding on a coyote carcass that we suspected to have been shot. Upon x-raying the highly scavenged coyote carcass, we found lead fragments. Within two days both condors were trapped, tested, and x-rayed. Both had lead in their digestive tracts, high blood lead levels, and were immediately transferred to the Phoenix Zoo and treated.

The condors survived the lead and were later re-released near the Vermilion Cliffs.

The Arizona Department of Game and Fish, working closely with the shooting community, made real strides in informing hunters about the presence of condors throughout the region and the potential danger of lead in the environment.

FUTURE PLANS

We will release the remaining condors being held in Arizona throughout the year and transport the 2004 young to the holding facility late in the calendar year to be released in 2005.

Young will continue to be released in small groups. We expect additional breeding attempts by released birds although it is unlikely the pair producing the young in 2003 will reproduce this year as they are still caring for the young condor.

As part of our condor management efforts we will monitor their movements using conventional telemetry and satellite-monitored PTTs. More GPS/PTTs will be placed on condors. Every effort will be made to limit public and condor interactions as we have done over the past several years. We will continue to try to locate carcasses upon which condors have fed, both out of concern for the potential of their ingesting lead or other environmental hazards and to know what they are eating. Any condor suspected of ingesting lead will be captured, x-rayed, have its blood tested, and, as appropriate, be treated and re-released. We will work closely with the Arizona Game and Fish Department and other cooperators to reduce lead in the environment and to otherwise enhance management and survival of the condors.

The first wild-produced California Condor to fly in two decades.

Chris Parish

Chris Parish (right) and Randy Townsend hand up a condor in a pet kennel to Bill Heinrich (right) and Norm Freeman. Norm Freeman purchased a specially-designed vehicle for transporting condors and other wildlife. These condors are to be taken from the World Center to the Arizona release site.

Christie Van Cleve

STAFF

Coordination, Bill Heinrich; Captive Breeding, Randy Townsend and Craig Carpenter; Reintroduction, Chris Parish and Sophie Osborn; Research, Grainger Hunt; Field Assistance, Brian Mutch, Jill Adams, Stephen Agius, Roger Benefield, Tim Bischof, Jason Blackburn, Brandon Breen, Ann Burke, Joseph Crapanzano, Ann Marie DiLorenzo, Tyrone Donnley, Sam Elizondo, Edward Feltes, Amy Lindsley, Thomas Lord, Megan Lout, David Loomis, Kristine McConnell, Betty Moore, Dennis Mott, Paul Mueller, Kate Parmentier, Elise Snider, Jonna Weidmaier, Anne Welch, and Jim Willmarth.

COOPERATORS

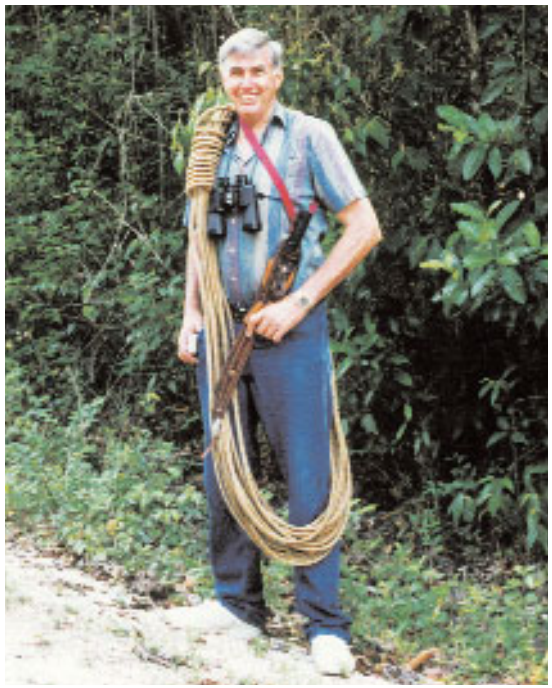
The historic Arizona reintroduction is a joint project among The Peregrine Fund, the Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, Arizona Game and Fish Department, Southern Utah's Coalition of Resources and Economics, and others.

Funding for the project was provided by the U.S. Fish and Wildlife Service, Peter Pfendler, the National Fish and Wildlife Foundation, Nina Mason Pulliam Charitable Trust, Disney Wildlife Conservation Fund, Steve Martin/Natural Encounters, The Kearny Alliance, Jane Turner Smith Foundation, Patagonia, Globe Foundation, Earth Friends, APS, Inc., Wallace Research Foundation, Norm Freeman, Arizona Strip Bureau of Land Management, and the Grand Canyon Conservation Fund.

Remembering Ron Yanke 1935 – 2004

In the spring of 1984 at 5:30 a.m. I arrived at a Boise, Idaho, truck stop to meet with three men who would later join the Board of Directors of The Peregrine Fund—Ron Yanke, Tom Nicholson, and Jim Nelson. They got together there most every Tuesday morning to share news, laughs, and a life-long friendship among themselves and to see others who knew they would be there and had stopped by. As I learned over the following years it was a mixed lot of people at "breakfast," from their trusted employees to the minister of Ron's church, someone down on his luck, or maybe a would-be or sitting governor, congressman, or senator wanting their support. Or even someone like me from a non-profit needing help in one form or another. You just never knew, but it was always enjoyable.

Barbara Jenny



Pat Burnham

To build the World Center for Birds of Prey we needed access for heavy trucks across property owned by Ron, Tom, and their wives, Linda and Diana, respectively, as the bridge on the county road to our site was old and rickety and likely to collapse from the weight of a gravel or concrete truck. At my first "breakfast," after a brief explanation of what we were doing and what we needed, they agreed with a handshake and laughingly suggested Jim should provide his earth-moving equipment as he had a construction company. During the following years we asked the three of them, along with their close friend, Harry Bettis, to join the Board and they all accepted.

A hand to draw for, each an ace in his own right. None of them was a birds of prey enthusiast per se, but all liked what we do and our achievement of annual meaningful results. These men, along with a few other Boise residents, several more who also joined our Board, formed the heart and soul of the community.

A few weeks ago Ron Yanke unexpectedly died. The world was a better place because of him and it is certainly poorer by his absence. Ron was a lanky, over six-foot tall man with an easy smile, quirky laugh, ready handshake, and a helping hand. After boarding an airplane in Guatemala, he had spoken with most everyone on it by the time it landed, even though most spoke another language. He was always there to help The Peregrine Fund and most every other worthy charitable organization or needy friend in the community. Most of his contributions were unknown and uncelebrated as publicity was not his motive. Few people beyond the benefactor knew of his generosity. I doubt he ever even thought of it as being a philanthropist. He was just being a good neighbor. Even his major business successes are not well known, such as when he and Tom Nicholson financed the beginning of Micron Technology and then later talked Jack Simplot into adding more money at another critical stage in the company's development. The multitude of business partnerships and ventures benefitting people and communities in Idaho and far beyond ranged from building white water rafts and knives to airplane charters, hotels, power plants, saw mills, and mines to ranches and farms.

Ron was in his third four-year term on our Board and had been its secretary for eight years.

Despite his busy schedule he attended almost every Board meeting and seldom missed even an Executive Committee conference call. His fingerprints are all over the World Center from the front entry gate built and installed by Yanke Machine Shop (the business his family founded and Ron took over operation of at 18 when his father became ill) to the heating and air conditioning on many of the buildings placed and maintained by his company. He even hauled in large rocks to landscape the public interpretive center and placed them personally with his crane. There was the time he, Tom, and Jim organized and put on a barbeque during the Peregrine Victory Celebration for 1,000 people with Ron and Tom doing much of the cooking and serving themselves. Not to be forgotten are the 340 acres of land the two of them and their wives donated to "square up the boundary" of The Peregrine Fund property, creating a buffer around the birds and facilities from future potential development. Then there was the money they donated to help Jim Nelson pave the road and the modular home Ron donated that is our office and living quarters in Arizona for the condor releases, and the list goes on.

He was bigger than life and probably had more fun in his 68 years than most others might in several lifetimes. I doubt he ever missed a sunrise and probably seldom was in bed much before midnight. There was just too much to do that he enjoyed. We miss Ron and things will not be the same without him. Our deepest sympathy for those he has left behind, both family and close friends. He has a special place in our hearts and minds, now and always. His spirit soars with the falcons just beyond life's horizon. Thanks, Ron.

Above: Ron Yanke (left), Tom Nicholson, and Harry Bettis (right) about to release a newly-banded Peregrine.
Below: Ron Yanke helping with our work in Guatemala.
Left: Ron as a young man with a Golden Eagle he temporarily removed from its nest in Idaho.

Archives of American Falconry

GOAL

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

STAFF

Founding Curator/ Archivist, S. Kent Carnie; Book and Manuscript Curator, John R. Swift; Research/Editorial Associate, William G. Mattox; Research Associates, Peter Devers and Natalie Nicholson; and Graphics Associates, Don Garlock and Jim Stabler.

COOPERATORS

The Archives is dependent on the support of many friends, falconers and non-falconers alike. In 2003 particularly noteworthy assistance was received from Frank Beebe, Bob Berry, Kent Carnie, Ron Clarke, Peter Devers, Jim Grier, Walter Hill, Tony Huston, Henry Kendall, North American Falconers Association, Kathleen Orlenko, Ken Riddle, Tim Sell, Will Shor, Scott Struthers, John Swift, and Jim Weaver.

Recognizing the loss of irreplaceable falconry memorabilia with the deaths of pioneering American falconers, The Peregrine Fund established the Archives of American Falconry (AAF) in 1986 to collect and preserve the physical evidence of the history of this sport. Originally directed at preserving "American" history, the ensuing years have seen a growing international flavor in our accessions. With a wide array of collections (correspondence, photographs, art, manuscripts, equipment, and memorabilia) and the finest known collection of English language books related to falconry, the Archives is unique in the world. It represents an invaluable resource utilized not only by falconers but by the academic community and the interested general public—truly, a living legacy!

2003 RESULTS

Having settled into the new archives quarters in the Herrick Collections Building, we have returned to the cataloging, preservation, and maintenance of our historical materials—the backbone of our archival activities. Not that we have discontinued "collecting" additions to our holdings; all of the materials received during this year (almost a hundred accessions, from single items to sizeable collections) have added both to the magnitude and the meaningfulness of our collections; the more complete, the more accurate the history!

Benefactors Bob and Carol Berry have now loaned (pending permanent transfer to the AAF) the famed Thornton silver-gilt urn. The most significant piece of historic falconry memorabilia available to the public, this urn was presented in 1781 to Colonel Thomas Thornton, founding President of The Confederate Hawks of Great Britain when he retired from that position. Given his and that club's roles in resurrecting falconry in Britain after over a century's hiatus, the historic and symbolic value of this unique piece cannot be over-emphasized. The urn now forms the centerpiece of a special display devoted to Thornton here at the Archives—thanks to the Berrys' generosity (see photograph).

Also a noteworthy addition this year is a complete, authentic Arab majles tent as used for centuries past by Arab falconers and presented by Kenton Riddle. The "complete" description is literal, to include two handsome Persian-style carpets (wall-to-wall in this 14 by 20-foot tent) as well as an array of decorative cushions and pillows. Included as well is the multitude of equipment and apparatus needed to make and serve the traditional Arab coffee so associated with post-hunt gatherings in this type tent. Our tent was on display at the North American Falconers Association meet this year and attracted the attention of a large number of falconers. We must now determine how to display the tent to its best advantage.

In1994, Canadian falconer-artist Frank Beebe promised we would eventually receive his falconry diaries; a promise fulfilled this year. All of his original chronological notes spanning the period 1932 through 2002 are now in the Archives, along with the original manuscript of his own account of his life to 1932. The at-the-time observations of a principal player describing the unfolding of falconry efforts on our continent, this gift represents a real treasure trove of history and a source of first-hand information, exactly the sort of thing the Archives is dedicated to collect and preserve.

On the establishment of the Archives, our priority was naturally focused on the (North) American history of the sport. American falconers have created our own brief history based on a worldwide heritage of some 40-plus centuries. Archives accessions from American falconers over the years have included materials reflecting—and originating from—this worldwide heritage.

The three very special gifts described above clearly exemplify the continuing expansion of the cosmopolitan aspect of our archival collections. Japanese art and equipment, a unique Persian manuscript, and literature in most of the European languages, to note but a few examples, have brought our collections to a new level. As the only such archives devoted to preserving the history of falconry in the world, we are, literally, unique. Is a name-change from "Archives of *American* Falconry" in order?

Reflecting this international role, we are launching efforts to produce Volume III in our Archives Heritage Publications Series, reprinting an historic

Jack Cafferty

English falconry book, Sir Thomas Sherley's *A Short Discourse of Hawking to the Field with High Flying Long-winged Hawkes.* Printed in 1603 as the third falconry work in English, it is known only by a single copy in Yale's Beineke Library. Despite its British origin, this work's age, rarity, and the fact that it was the first book in English penned by a practicing falconer make it a natural candidate for our Heritage Collection. Based on extensive groundwork by Archives Research Associate Peter Devers, we hope to see this work off the presses by mid-2004.

FUTURE PLANS

Any plans for the future must contain the need for continuing cataloguing and maintenance of present holdings as well as the addition of future accessions. Beyond this, however, lies the need for a better Archives outreach capability to describe holdings and list catalogues electronically on line so that all we support can learn of, access, and appreciate our assets. Completion of the cold room originally planned in our new facility remains a goal. A correctable deficiency in our ability to store and preserve properly photographic negatives, slides, movie film, and the like, an improved capability can only attract additional collections of those materials. Finally, we trust our additional international holdings and status will in turn attract increased international support for our archival efforts.

Captive Breeding at the World Center for Birds of Prey

GOAL

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 for Birds of Prey is crucial to the success of both the Aplomado Falcon and California Condor restoration programs. These programs annually require large numbers of birds for release to the wild. The nature of these raptors makes breeding them in captivity both a labor-intensive and challenging effort. Factors such as nutrition, incubation management, and reduction of outside disturbances must be considered for successful breeding to take place. A tremendous amount of dedication, time, and knowledge is required by all involved to provide the best possible results.

2003 RESULTS

Aplomado Falcon—In 2003 the Aplomado Falcon restoration program had 34 Aplomado Falcons lay 297 eggs. One hundred eleven (37%) of this total were fertile, 93 (84%) hatched, and 90 (97%) survived to release age. Due to financial constraints the number of release sites was reduced, therefore fertility was deliberately reduced by discontinuing artificial insemination mid-season to reduce the production of young. A two-year-old female was a first-time layer producing three infertile eggs. She was not artificially inseminated and did not copulate with her mate. One ovulating female in 2002 did not lay eggs in 2003. Artificial insemination (AI) plays an important role in obtaining fertile eggs. Three Aplomado Falcon pairs copulated and produced 16 eggs and seven surviving young. An additional 83 young were produced using AI. Twenty-four ovulating females were artificially inseminated and produced 251 eggs. One hundred (40%) were fertile, 86 (86%) hatched, and 83 (97%) survived to release age. Total production from the copulating and artificially inseminated pairs was 90 chicks. Eighty young were released to the wild, and 10 were retained to become part of our breeding population.

Egg removal and natural incubation by Peregrine Falcons increase the hatchability of Aplomado Falcon eggs. An Aplomado Falcon will begin incubation after three or four eggs are laid. By removing eggs as they are laid the females will continue to lay up to eight or more eggs. Falcon eggs have a higher hatchability in artificial incubators if they are initially incubated naturally by falcons. Peregrine Falcons continue to be reliable incubators of Aplomado Falcon eggs, increasing the number of young that can be produced. Of 100 fertile eggs incubated by Peregrine Falcons, 86 (86%) hatched and 83 (97%) survived.

Cal Sandfort

Emma Christensen feeding hungry downy Aplomado Falcons.

In 2004 we anticipate increasing Aplomado Falcon production from that of 2003 by continuing artificial inseminations through the entire season as we have done in previous years.

California Condor—There are 41 California Condors at The Peregrine Fund's World Center for Birds of Prey at this time. Two of these condors are too young to breed and are being held for future propagation because of their genotypes. One condor is being used as a display bird and as a mentor for fledgling and nestling puppet-reared California Condors. The remaining condors are our 19 pairs of breeders. These breeders laid 21 eggs during the 2003 season with 16 fertile (76%). There were 13 eggs that hatched (81%), and two of the eggs were transferred to the Los Angeles Zoo a few days before pip and were hatched there to facilitate later release to the wild. The repairings of adults that were done in 2001 have increased condor reproduction. Two females that had been laying infertile eggs for several years, one since 1996 and the other since 2000, produced fertile eggs for the first time during the 2003 season.

The 2003 season was very busy with condor transfers and vaccinations. Each California Condor was given two West Nile Virus vaccinations and had three blood draws to determine the effectiveness of the vaccine. There were two condors that were sent to other breeding facilities—one male condor was transferred to the Oregon Zoo and one female was transferred to the Los Angeles Zoo. The Peregrine Fund also received three California Condors, one female was received from the San Diego Wild Animal Park and a pair was received from the Los Angeles Zoo. The purpose of these transfers was to better distribute the gene pool between the different captive breeding populations. After the breeding season slowed in late fall, we also made three pair switches for compatibility reasons and again to increase fertility.

We are optimistically expecting an increase in California Condor reproduction in 2004 because we have had a milder winter and should have a quieter spring and summer than in 2002 and 2003 when the additional California Condor laboratory/holding facility and the Herrick Collections Building were constructed.

Staff

Captive propagation at the World Center is accomplished by Cal Sandfort (Aplomado Falcons) and Randy Townsend (California Condors) with assistance from Craig Carpenter, Emma Christensen, Travis Rosenberry, 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).

Student Education

GOAL

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.

	PhD	MSc	BSc
Students who have directly worked with us and graduated	17	47	>12
Currently working with us and on degree programs	3	10	1

RESULTS

Cumulative—One of the most important ways in which The Peregrine Fund makes lasting contributions to global conservation is through the training of undergraduate and graduate students. A well-educated conservation community is one of the main hopes for the future of conservation, both in the U.S. and abroad. The training of students also provides another avenue for The Peregrine Fund to make good scientific contributions since graduate studies involve the preparation of theses and dissertations which add to our understanding of biotic processes and systems.

2003—Students were supported in connection with seven different projects in 2003. In the Neotropics, Kathryn Harper completed a study on "Monitoring reproductive behaviour in captive Harpy Eagles" in Panama in connection with her Bachelor's degree at McGill University. Kurt Burnham continued his studies on Gyrfalcons and Peregrine Falcons in Greenland in connection with his D.Phil. program at the University of Oxford. Alberto Macias Duarte finished his M.Sc. at the Universidad Autonoma de Chihuahua in connection with our Aplomado Falcon program. Five Pakistani students participated in the Asian Vulture Crisis Project and provided invaluable help in assisting us to document and track down the cause of the vulture decline on the Indian subcontinent. They included Muhammed Arshad, Shahid Mahmood, Jamshed Chaudry, and Shakeel Ahmed who were provided with financial support for their studies for M.Phil. degrees at the University of Multan, Pakistan, and Ahmad Ali, who is pursing an M.Sc. degree. Elsewhere in Asia, Nyambayar Batbayar continued his field studies in Mongolia on the Cinereous Vulture for his M.Sc. degree at Boise State University, and we began support of New Guinea student Leo Lagra studying the little-known New Guinea Harpy Eagle. Ruth Tingay completed writing her dissertation on the breeding systems of Madagascar Fish Eagles toward her Ph.D. at the University of Nottingham, United Kingdom. See the Madagascar report for additional students.

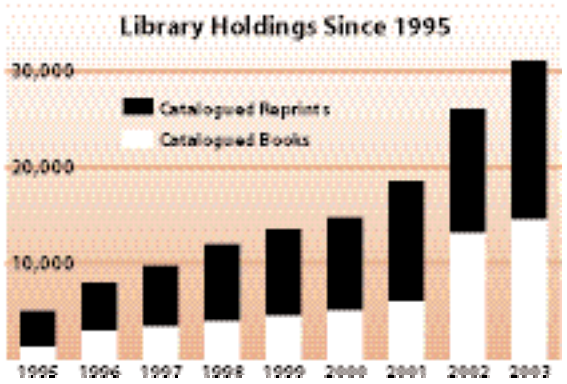
FUTURE PLANS

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

Research Library

GOAL

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



RESULTS

Cumulative—The lack of access to adequate library resources has been a chronic problem for students and researchers in many parts of the world and even in some regions of North America.

Since 1994, it has been our goal to amass a comprehensive ornithological and conservation biology research library and to make these resources freely available to the global research community. We are now achieving that goal. The most important milestone for the research library occurred in October 2002 with the completion of the Herrick Collections Building where the library and associated offices now occupy about 5,000 square feet of space.

2003—The reorganization of our library holdings was completed in 2003 following our move into new quarters in the new building. We acquired a large number of new books and journals through a combination of donations and purchases and contributions from 19 individual and institutional donors. Particularly large gifts were received from the Edward Grey Institute of Field Ornithology (University of Oxford), Tracy Fleming, Lloyd and Julie Kiff, Bertram Murray, Hans and Pam Peeters, Chandler Robbins, Marian Seibert, and Marie Winn. Journal exchanges were made with several institutions, including the Air Force Academy, Estonian Ornithological Society, Hungarian Institute of Field Ornithology, Patuxent Wildlife Research Center, and the Josselyn Van Tyne Ornithological Library. Over $6,000 worth of duplicate books and journals were sold, and the proceeds were used for new acquisitions.

By year's end our library holdings included 14,500 books and separates, 16,000 catalogued reprints, and full or partial runs of over 1,200 journal titles. We presently receive 146 technical journals, 32 conservation magazines, and over 100 newsletters by subscription or exchange. Searchable versions of the library and reprint catalogues and inventories of our journal collection and duplicate journals are maintained on The Peregrine Fund web site. A new document scanner donated by Lloyd Kiff and Clayton White now enables us to answer requests from researchers for PDF copies of any article in our collection free of charge.

FUTURE PLANS

We expect the research library to grow in size and significance, owing to the generous support that we receive from many donors and other organizations. We will continue to emphasize the acquisition and archiving of paper copies of technical ornithological journals, whether global or regional, since a large number of libraries are now discarding these publications as a result of budgetary and space limitations. At the same time, we will continue to seek the most efficient methods of transferring information to our clientele, the global research community, as possible. Our research library is now "on the map" for researchers on every continent, and we will make a special effort in the future to bring its existence to the attention of all ornithologists and bird conservationists. We welcome additional donations to the library, all of which are tax deductible for the donor.

Staff

The library is supervised by Lloyd Kiff. Lynda Leppert and Travis Rosenberry provided invaluable library management assistance in 2003.

Education Program

GOAL

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.

Brian Porter / Porter's Photography

Long-term friend and volunteer (12 years) Don Fox shows visitors a male Peregrine Falcon on the stage in the Interpretive Center.

Brian Porter / Porter's Photography

Students visiting the Interpretive Center are provided many hands-on educational experiences as seen here. Complete with touch screen monitors, feathers, and interactive displays, the facility provides a lasting impression on visitors.

Since the Education Program's inception in 1985, more than 700,000 people have been directly reached through on-site and off-site educational presentations. The program is based out of the Velma Morrison Interpretive Center at the World Center for Birds of Prey. The facility has grown and expanded to include more than 15,000 square feet of buildings and includes a gift shop, courtyard, art gallery, classroom, three theaters, and many interactive displays. The displays include everything from the biology and ecology of raptors to what you can do to help conserve nature. We work to improve our Education Program and facility and strive to provide the best possible educational experience for each and every visitor.

2003 RESULTS

We reached more than 29,800 people through on-site and off-site educational programs in 2003. Over 26,300 people visited the interpretive center, of which 4,529 were students on school-sponsored trips. While the majority of students came from the greater Boise, Idaho, area, 32 different communities in Idaho and Oregon were represented. An additional 3,553 individuals were reached through 25 off-site educational presentations. Visitors came from all 50 states and more than 30 countries. As with previous years, word-of-mouth continues to be the primary reason why visitors come to the facility.

We continue to update our education programs to facilitate the Idaho Achievement Standards and specific school district curriculum for our school

Jack Cafferty

In addition to on-site educational tours, we also provide outreach to those who are unable to visit. Here, Trish Nixon informs students of the importance of the rainforest and The Peregrine Fund's work in Latin America.

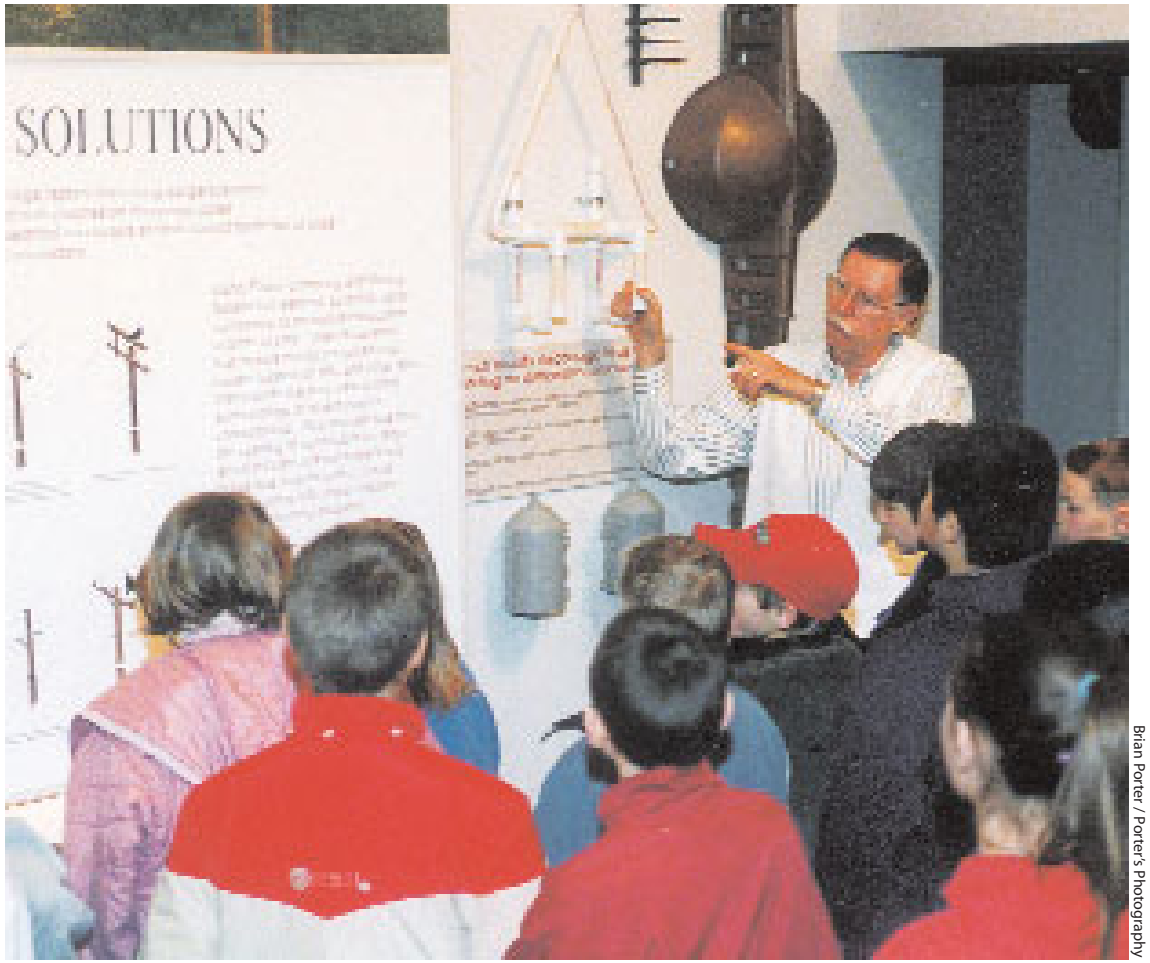
groups, and to become more flexible to the needs of our non-school visitors. Teachers and educators can call ahead for a specific topic to be covered and the tour curriculum can be adapted to fit their needs. Qualifying low-income schools are provided free admission to the facility and more than 730 students participated in the program.

Our stellar group of more than 90 volunteers donated 7,194 hours this year. Volunteers remain the backbone of the program. The volunteers take great pride in their duties at the facility, which include everything from handling birds to giving informative presentations and working in the gift shop. This volunteer effort allows us to implement an educational program that provides visitor interaction with knowledgeable people in a friendly atmosphere conducive to learning. We are grateful to have such a dedicated group of volunteers. Please see the names of volunteers contributing over 50 hours elsewhere in this report.

FUTURE PLANS

We will continue to update and improve the interpretive center to provide an intriguing hands-on learning experience for each visitor. School curriculum will evolve as needed and we will add pre- and post-tour information packets as part of the lesson plan.

Additional education birds and exhibits will be considered as the program expands and grows.



Brian Porter / Porter's Photography

Bill Gehring, a volunteer docent, points out how power lines can be designed to prevent the electrocution of birds of prey. This exhibit was sponsored by the Idaho Power Company and remains a popular display for visitors.

Brian Porter / Porter's Photography

This 16-year-old male Golden Eagle has been at the center nearly four years. After an injury which left him sightless in one eye, "Jack" was donated by a falconer and the U. S. Fish and Wildlife Service for our use. With a six-foot wingspan and dramatic presence, Jack provides many visitors with the rare chance to get close to a mature Golden Eagle.

Staff

Program and Facility Director, Jack Cafferty; Volunteer Coordinator and gift shop, Brook Sims; Raptor Specialist, Trish Nixon; Education Programs Coordinator, Ann Peden; and Facility Maintenance, Randy Stevens.

Cooperators

Financial partners this year include the Laura Moore Cunningham Foundation, Harry W. Morrison Foundation, U.S. Bancorp Foundation, Boise Cascade Corporation, Islands Fund, Gannett Communities Fund/Idaho Statesman, Micron Technology Foundation, Key Foundation, Wells Fargo Bank Northwest, N.A., Ada County Association of Realtors Foundation, INEEL through corporate funds from Bechtel BWXT Idaho, LLC, Bank of America Foundation, Weyerhaeuser Company Foundation, and numerous individual donors.

Volunteers Contributing Over 50 hours of Service:

Mark Armstrong, Tim Backoff, Pat Baumback, Jean Bernick, Karen Brender, Ray Brucks, Amy Brueck, Gwen Chavarria, Rebecca Chavarria, Bert Cleaveland, Helen Crewse, Louis DeWitt, Betsy Eldredge, Phil Eldredge, Barbara Elliott, Leo Faddis, Claudia Fernsworth, Anne Fitzsimmons, Don Fox, Joni Frey, Bill Gehring, Kathryn Hampton, Amy Hazekamp, Tim Hazekamp, Kristen Holst, Bryan Jennings, Liz Johnson, Ann Jones, Ruth Kassens, Gerri Kawczynski, Connie Leavitt, Fred Lidinsky, Larry Lievsay, Eileen Loerch, Mike McSweeney, Milt Melzian, Shawna Myers, Tracey Neill, Adam Nielsen, Jack Osgood, Brit Peterson, Cathy Quam, Randy Rasmussen, Mary Rotman, Nikki Sartin, Ellen Shaw, Chan Springer, Josh Stevens, Diann Stone, Dick Thatcher, and Paul Wolters.

High Arctic Institute

GOAL

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

Being over 2,656 km (1,660 mi) long from north to south, Greenland encompasses the entire spectrum from the low Arctic through the high Arctic, providing a unique opportunity for research. Even with about 85% of Greenland being ice-covered, the remaining ice-free land is home to an estimated 1,500 pairs of Peregrine Falcons and over 750 pairs of Gyrfalcons. In addition, Greenland has large numbers of seabirds, waterfowl, songbirds, and shorebirds. With almost 90% of the human population living in southwest Greenland, large undisturbed areas exist. Greenland is a unique research location where natural and human causes of change can be examined. Expanding our knowledge of the falcons and other wildlife in Greenland now is critical to be able to improve our ability to make informed predictions and recommendations for conservation.

In 1993 The Peregrine Fund began working in Greenland following up on research initially begun in Kangerlussuaq in 1972 under the leadership of Bill Mattox (Greenland Peregrine Falcon Survey). Since 1993 the geographic scope of work has expanded, and in 1997 we founded the High Arctic Institute, Thule, Greenland, to help facilitate research demonstrating our long-term commitment to Greenland's natural resources and wild places. In addition to continuing the work in Kangerlussuaq we also have added other study areas in Greenland.

This map illustrates northern breeding sites and southern wintering areas of these Peregrine Falcons. The colored border on each photo relates to the locations on the map, which were provided by satellite-monitored transmitters on each falcon.

Erin Gott

Jack Stephens, jackstephensimages.com

2003 RESULTS

Kangerlussuaq—During the 2003 field season we placed satellite-monitored transmitters (PTTs) on four adult female Peregrine Falcons at the nest. Three of these females produced a total of 10 young and one female failed for unknown reasons. In addition, two PTTs were placed on adult female Gyrfalcons. Monitoring of the local Gyrfalcon and Peregrine Falcon populations continued with 71% of the known checked Peregrine eyries occupied and an average of 3.29 young produced per successful nest. However, the Gyrfalcon population experienced the lowest occupancy we have seen in the past five years with only five (10%) of 50 known surveyed eyries occupied and only one known to produce young. The low occupancy and reproduction may be a result of limited numbers of ptarmigan, the Gyrfalcon's primary prey, present in the area, particularly early in the breeding season. A very small amount of blood was collected from each falcon for genetic analysis. Samples were collected at Gyrfalcon eyries for carbon dating to determine length of use.

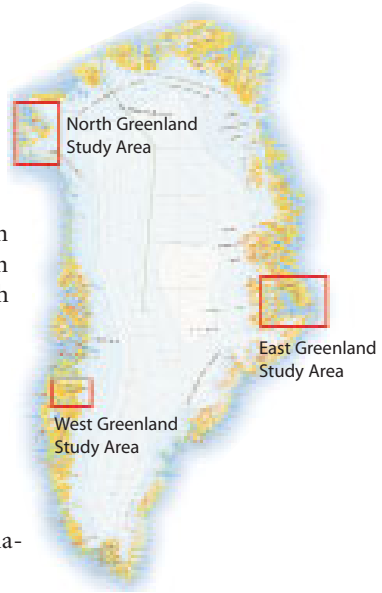
Thule—The Thule field season was dominated by continual bad weather from mid to late July up through August. During this period we experienced weekly storms with winds over 80 knots making it very difficult to use our boat. Only a small portion of the study area was surveyed with the four local Peregrine eyries all found occupied, but with only one positively known to produce young. Two Gyrfalcon eyries were checked, one was occupied, and in addition we located two new nests by using data from PTTs placed on adult female Gyrfalcons at a trapping station during 2002. In 2003 we placed PTTs on three female Peregrine Falcons at the nest. Additionally, at a trapping station set up in September we placed PTTs on nine Gyrfalcons and one more female Peregrine Falcon. As in Kangerlussuaq, blood and samples from eyries were also collected.

Gyrfalcons at the falcon trapping station in North Greenland.

Erin Gott

FUTURE PLANS

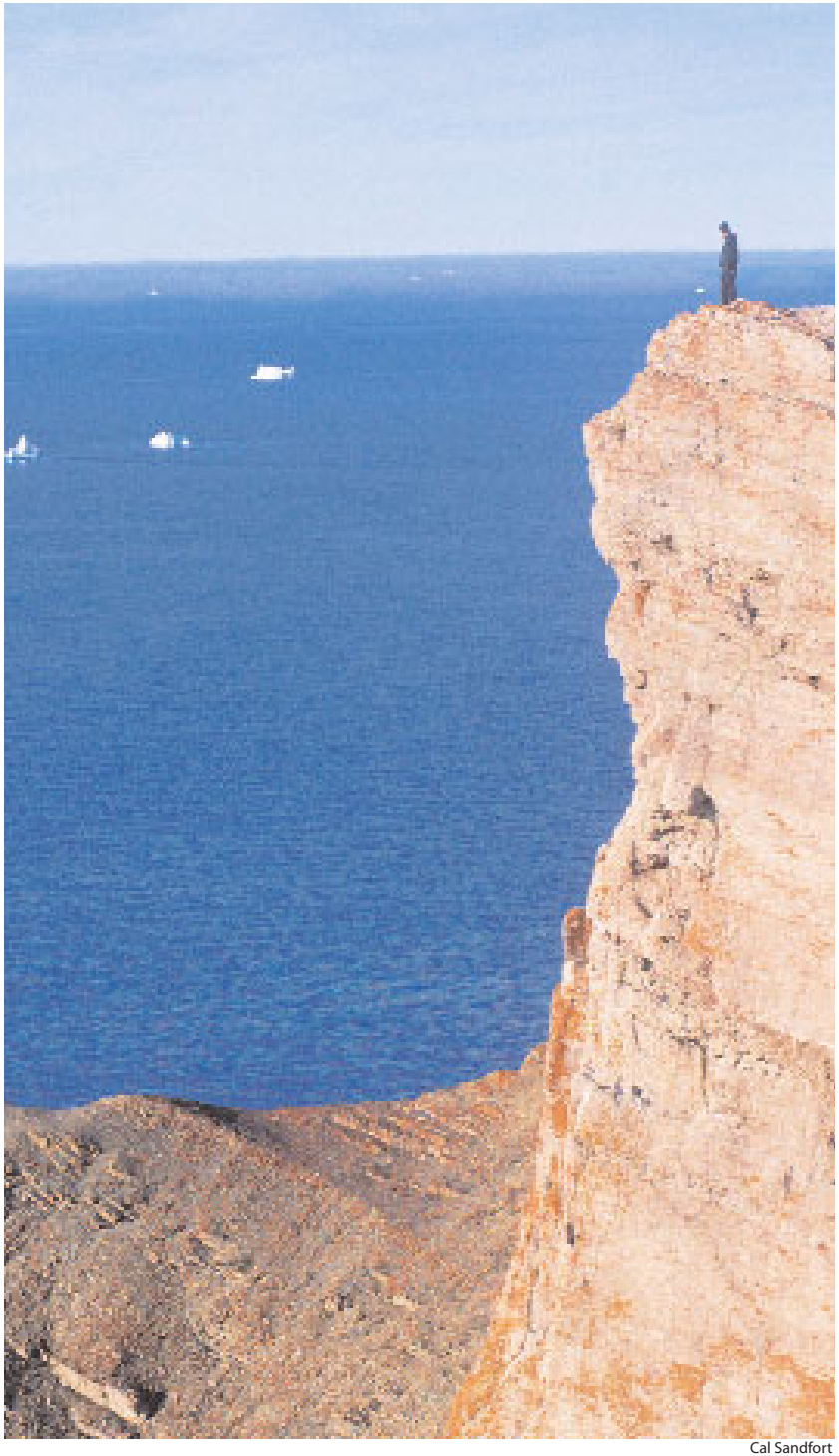
During the 2004 field season we will place a limited number of PTTs on falcons in the Thule and Kangerlussuaq areas in addition to collecting blood samples for genetic analysis and gathering more information on reproduction. In the fall we will establish a trapping station at Scoresbysund, East Greenland, to attach PTTs to adult Gyrfalcons and collect blood samples from a minimum of 20 individuals. Further, we will spend approximately three weeks in Iceland to collect blood samples from as many Gyrfalcons as possible. Information from blood will enable us to examine genetic variation between and within these populations. Knowing where and when falcons breed, the reproduction and mortality rates, migratory timing and paths, and genetic similarities and differences between geographic populations not only increases our knowledge of each species and their relationships, but also allows for informed conservation recommendations to be made.



Right: Searching for falcon eyries can be challenging.

Below: Nestling Gyrfalcons at the eyrie.

Brian Mutch



Cal Sandfort

Staff

Kurt Burnham manages this project under the general direction of Bill Burnham and with special assistance from Ian Newton. Jack Stephens is the Thule coordinator and lives in and maintains the High Arctic Institute facility. Jack Cafferty assists with U.S. permits and logistics in addition to spending time in the field. Also participating in 2003 were Erin Gott, Dan Martin, Brian and Ruth Mutch, Cal Sandfort, Bob and Laura Rosenfield, John Bogan, Brad Bulin, Mandi Huntington, Erik Olson, Jason Reiman, and Benjamin Schmitt.

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 sponsor is the Department of the Interior/Bureau of Land Management. Genetic analysis is accomplished with the cooperation of Jeff Johnson and David Mindell at the University of Michigan.

Financial support for this field season was provided by the Gordon and Betty Moore Foundation, The John D. And Catherine T. MacArthur Foundation, Joe and Flinda Tertel-ing, and Dan Martin.

Special thanks to the residents of Thule Air Base for all of their help and support. We also thank the 109th Air National Guard for their critical logistical support and recognize the National Science Foundation for their cooperation. In addition, thank you to VECO and Robin Abbott and Tom Quinn for their essential help. Further, we thank Bent Brodersen and Basse Vêngtoft of KISS. The continued cooperation of Kaj Kampp, Copenhagen Zoological Museum, is valued.

Neotropical Raptor Conservation Program

GOAL

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

The Peregrine Fund's Neotropical Raptor Conservation Program focuses on the 86 diurnal raptors that occur in the Neotropical region that encompasses Central and South America and the Caribbean. This region is also the winter home for most species of birds that nest in North America. The program is centrally located in Latin America at our Panama branch, Fondo Peregrino-Panamá and the Neotropical Raptor Center. We aim to conserve raptor species in jeopardy (16 endangered or vulnerable species) to improve knowledge of raptor species with an emphasis on those for which too little is known to determine their conservation status (21 species); answer important conservation questions using raptors' ecological needs as a yardstick for conservation; reduce human persecution of raptors using the Harpy Eagle as a flagship for conservation; conserve important tracts of land; and provide leadership and local capacity development for raptor conservation and research in Latin America. We achieve these aims through several projects:

Rick Watson

The Neotropical Raptor Network aims to promote collaboration and communication among raptor conservationists throughout Central and South America and the Caribbean.

Rick Watson

Magaly Linares promoting the Neotropical Raptor Network to participants at the VIIth Neotropical Ornithological Conference, Puyehue, Chile, in October 2003.

- Development of our local organization, Fondo Peregrino-Panamá
- Development of the Neotropical Raptor Network
- Harpy Eagle restoration project for Central America
- Harpy Eagle research and conservation project
- Neotropical environmental education project
- West Indies (Caribbean) raptor conservation project
- Orange-breasted Falcon project

2003 RESULTS

In 2003 we made important improvements to our local administrative capacity by promoting Magaly Linares to Director of Fondo Peregrino-Panamá, and by hiring and training an administrative assistant/bookkeeper. During the year we signed a cooperative agreement with the United States Agency for International Development-Panama for financial support of this program worth $1.5 million over the next four years. We also signed a cooperative agreement with the Central American Commission for Environment and Development (CCAD) to promote the Harpy Eagle as a flagship species for conservation of the Mesoamerican Biological Corridor, and began expanding efforts to Belize and Costa Rica. We strengthened relationships with indigenous communities not only in Darien province but now in the Naso Teribe region of Bocas del Toro to facilitate field work and collaboration related to Harpy Eagle research and conservation and public education among local communities. We developed the Fondo Peregrino-Panamá web site in Spanish and have initiated the Neotropical Raptor Network with a first-ever Spanish language forum for internet communications dedicated to raptor research and conservation.

FUTURE PLANS

We will continue to build staff capacity of Fondo Peregrino-Panamá, especially in the environmental education project, and we will develop a financial sustainability plan. We will review and develop new raptor conservation and research initiatives as possible and appropriate, to include implementing the Neotropical Raptor Network to promote information exchange among raptor experts, captive breeders, zoos, and other conservationists and decision makers.

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 under each project. Dave Whitacre is a senior scientist for this program.

Cooperators

The partnership of many organizations and individuals makes this program possible, including Autoridad Nacional del Ambiente (ANAM), Autoridad del Canal de Panama (ACP), Fundacion Ciudad del Saber, and the Ministry of Education. Jacobo Lacs, who serves on our Board of Directors, provides invaluable support and assistance.

Financial support in 2003 was provided by Wolf Creek Charitable Foundation, the United States Agency for International Development (USAID), Disney Wildlife Conservation Fund, Mr. and Mrs. Jacobo Lacs, and the James and Barbara Cimino Foundation. The U.S. Agency for International Development has provided economic and humanitarian assistance worldwide for more than 40 years.

Neotropical Environmental Education

GOAL

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

Staff

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

Cooperators

We collaborate with the Ministry of Education (MEDUC); ANAM; ACP; Instituto Nacional de Cultura (INAC); Soberania, Chagres, and Camino de Cruces National Parks; Ecological Police; Tierras Colectivas Emberá y Wounaan, Comarca Emberá/Wounaan, Comarca Ngobe-Bugle; Smithsonian Tropical Research Institute (STRI); Academy for Education and Development (AED); and Parque Metropolitano.

Important financial support was received from the U. S. Agency for International Development (USAID), Wolf Creek Charitable Foundation, the Disney Wildlife Conservation Fund, and the Iowa Ornithologist's Union. Clave2/Imprenta Pacífico and T-Shirt Interamerica provided in-kind support.

The education program is an important part of the larger effort to restore viable wild populations of Harpy Eagles throughout their former range within the Mesoamerican Biological Corridor from southern Mexico through Panama. Harpy Eagle restoration, combined with a direct, on-going, and systematic environmental education program, helps to protect eagles and large habitat tracts that maintain biodiversity and ecological processes necessary for the survival of this and many other forest species. The education project benefits from the Harpy Eagle's value to Panama as the national bird and its importance in the cultures of many countries and indigenous peoples.

2003 RESULTS

This year our education program reached more than 3,550 children and adults in the Darien region where most breeding eagles remain in Panama and more than 3,250 in the Panama Canal watershed where we are experimentally releasing captive-bred Harpy Eagles. We applied specially designed traditional and non-traditional evaluation methods to almost 600 participants to measure the impact of our education program and found a significant improvement in attitude and understanding. Regular evaluations are important to measure meaningful results and to guide future actions.

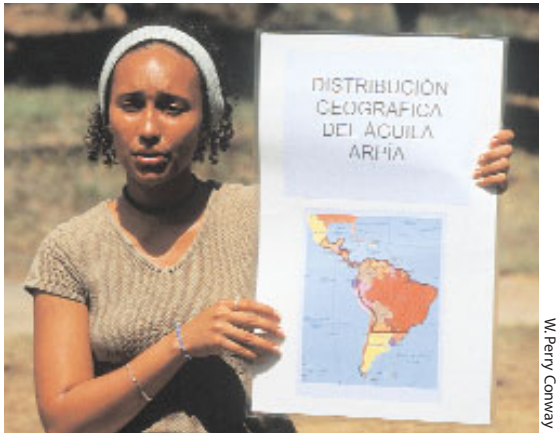
Our partnership and support of the community education program in Belize was maintained through the year working in collaboration with the Belize Zoo by providing educational materials used in communities near Harpy Eagle release sites in Belize. A non-releasable Harpy Eagle was also provided to the Belize Zoo for display and education.

With the outstanding success of the Harpy Eagle breeding effort, we have expanded the education program to communities near future Harpy Eagle release sites in Bocas del Toro, western Panama. We visited 11 Naso indigenous communities with 3,340 inhabitants located close to the Teribe River, as well as another smaller indigenous group, the Ngobe-Bugle. Their traditional authorities and the regional office of the national wildlife department (ANAM) were contacted to agree on a program of environmental education in these communities, beginning with surveys to understand attitudes toward Harpy Eagles, other raptors, and conservation in general.

On a country-wide scale we completed a very successful children's drawing contest named "Harpy Eagle, National Bird of Panama and Symbol of Nature Conservation." Students from elementary schools from across the country participated. Twelve winners were selected by judges from ANAM, Ministry of Education (MEDUC), AED-USAID, Instituto Nacional de Cultura (INAC), ACP, and members of our staff. The contest was organized to increase the interest and knowledge of the Harpy Eagle, Panama's national bird, and to increase pride among Panamanian children using this spectacular bird as a conservation symbol. The winning entries were published in a children's supplement of a national newspaper that is distributed to over 50,000 readers and will be published as a 2004 calendar. Another success was a regional "Traditional Story Contest" organized in Darien. Students were asked to involve their parents in writing traditional stories related to Harpy Eagles. The stories are being translated to both Emberá and Wounaan dialects as well as Spanish for publication in a book. We also developed educational materials, such as an outdoor display at our Panama headquarters, six large posters for the Harpy Eagle Visitor's Center at Summit Garden Zoo, and a "Children's Page" on our Spanish web site, with informative and interactive content.

FUTURE PLANS

Community education efforts will continue in the Panama Canal watershed where Harpy Eagle releases occur year around, in Darien where Harpy Eagle field studies continue, and in Bocas del Toro where Harpy Eagle releases are planned to occur in the near future. We will continue to provide educational materials and expertise as needed to our partners in Belize where Harpy Eagle releases are occurring, and expand our collaborative efforts to partners in the Dominican Republic where education focuses on the critically endangered Ridgway's Hawk. We plan to finish the raptor and Harpy Eagle supplement to the environmental education curriculum guide approved by Panama's Ministry of Education for use in elementary schools throughout the country.



W. Perry Conway

Rodolfo Mosquera

Above: Kathia Herrera describes Harpy Eagle distribution and ecology to students in the community of Santa Clara.

Left: Peregrine Fund biologist José Vargas plays a game that explains the web of life to children in Darien.

Harpy Eagle Conservation and Research

GOAL

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

Harpy Eagle released and assuming its rightful place in nature as a top predator in the forests of Central America.

Angel Muela

With hind talons the size of tiger or grizzly bear claws, the Harpy Eagle is a formidable raptor with few natural predators and capable of capturing sloths, monkeys, and even deer. Only humans threaten the Harpy Eagle's existence through direct persecution and habitat degradation. To help conserve this species in nature, our program is multi-faceted. We are working (1) to prevent direct persecution through education (see Neotropical Environmental Education), (2) to conserve Harpy Eagle habitat by determining the factors limiting eagle populations and sharing that information with local, regional, and national governments, and (3) to develop hands-on species restoration techniques as were used for the Peregrine Falcon. Successful conservation of the Harpy Eagle provides an umbrella of protection for the entire forest and diversity of life that lives there with the eagle.

2003 RESULTS

Captive Propagation—During the second year (2002/2003 breeding season) at our new breeding facility in Panama the three Harpy Eagle pairs laid 17 eggs, of which eight were fertile and seven hatched and survived. In comparison, during the 2001/2002 breeding season we produced 17 eagles from 18 fertile eggs. This breeding season's production is lower than the previous year's but is likely to be normal. A total of 24 eagles have now been raised in Panama since the Neotropical Raptor Center was established.

Release—In 2003, five fledgling captive-produced Harpy Eagles were relocated to Belize. One will remain in the Belize Zoo's environmental education program. The other four were successfully released near the Las Cuevas Research Station located close to the Belize border with Guatemala. Once the eagles have begun capturing their own food we intend to translocate them to the Rio Bravo region where abundant suitable forest exists in a safer environment. The remaining 12 eagles produced in 2002 and one 2001 eagle were released in Panama's Soberania National Park. Three of the seven 2003 eaglets have already fledged and were recently taken to our hack site to join the other eagles. Shortly we will begin

capture of the eagles that are independent of human care and re-release them in suitable areas in Panama, Belize, and possibly Costa Rica where large areas of suitable habitat remain with very few or no other Harpy Eagles present.

Research and Conservation—The cooperative agreements with Tierras Colectivas Emberá y Wounaan and Comarca Emberá-Wounaan peoples were extended for another three and five years, respectively, to conserve Harpy Eagles and other raptors within these native lands. We are now monitoring and annually collecting information at 22 Harpy Eagle nests in Panama, and the number increases annually. Most nests are in Darien Province which adjoins Colombia. As part of the monitoring and research program, six Emberá and Wounaan parabiologists were trained in raptor identification, plant identification, design and use of field techniques, monitoring of eagle nests, use of equipment such as GPS, compass, and clinometers needed for making habitat descriptions, and to use environmental education techniques (talks, dynamic plays, and interviews). Training and employing parabiologists is being accomplished with the idea of making the Harpy Eagle project sustainable in the long term. Not only do local people collect information, but they also promote raptor conservation. Rodolfo Mosquera, one of the parabiologists, went to Mexico to give a talk about the conservation and education work that he helps to implement in the Darien.

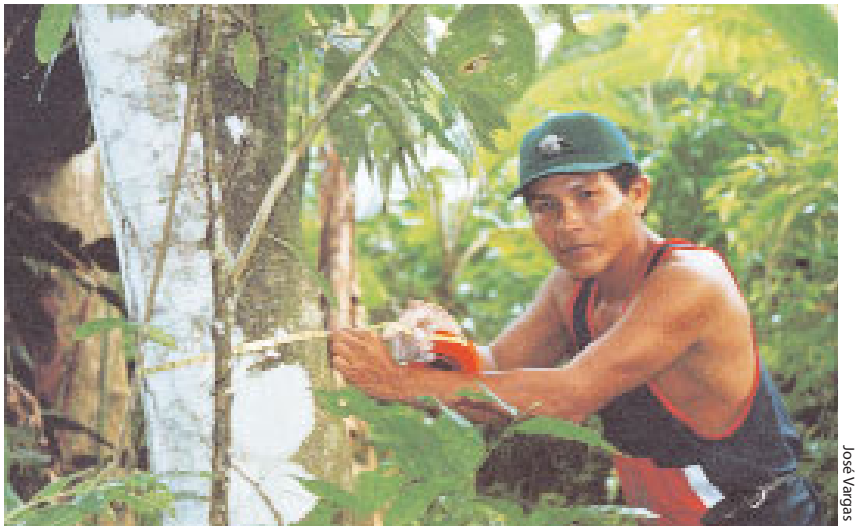
Marta Curti ascends to a Harpy Eagle nest in Darien.

Angel Muela

FUTURE PLANS

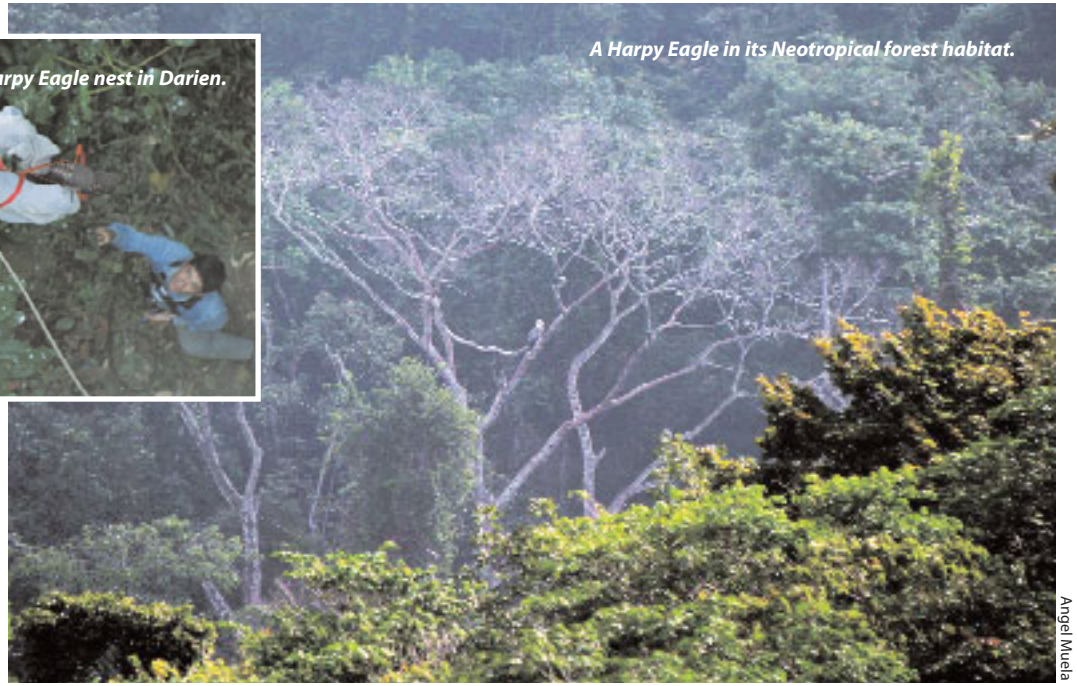
As we continue to gain insight and experience with captive breeding and release of Harpy Eagles, we determine the number of breeding pairs and young for release necessary to predictably bolster remnant and reestablish extirpated populations of eagles in suitable habitats in Latin America. Although this hands-on restoration program remains experimental as a pilot program, much has already been achieved and learned. These results bode well not only for what can be achieved for the Harpy Eagle, but for other large forest eagle species globally. The new release locations planned for eagles are Bocas del Toro, Panama, Rio Bravo in Belize, and at sites in Costa Rica that are yet to be selected.

Research and conservation actions will continue in the Darien of Panama and be enhanced with indigenous groups. Environmental education will remain an important part of our conservation strategy for the Harpy Eagle.



José Vargas

Parabiologist Eloy Aripio measures the dbh (diameter at breast height) of a tree as part of a study to understand Harpy Eagle nest site selection.



A Harpy Eagle in its Neotropical forest habitat.

Angel Muela

Staff

José de Jesús Vargas is the Coordinator for the research project conducted in the Darien, assisted by Emberá y Wounaan parabiologists Eloy Aripio, Dadildo Carpio, Bilomar Doviaza, Rodolfo Mosquera, Rogelio Peña, and Gabriel Menguizama. Nadia Sureda and Saskia Santamaria are responsible for the captive propagation and Angel Muela and Marta Curti implement eagle releases. José de los Santos López, Noel Guerra, Próspero Gaitán, Bolívar Rodríguez, Omar Fernández, and Edwin Jiménez raise raptor food and provide maintenance assistance to the area and facilities. Assisting in the field with Harpy Eagle release were Elsie Asworth, Lisa Bucci, Edwin Campbell, Johana Cedeño, Jerod Clabaugh, Bertrand Eliotout, Corrie Folsom, Humberto Fossatti, Jose Guerra, Shelly Johnson, Eva Mac, Liza Mora, Phillipe Potvin, Laura Riba, Felix Sandoval, Dane Springmeyer, Jennifer Struthers, Hau Truong, and Leah Webb.

Collaborators

The Harpy Eagle project depends on the partnership of many individuals and organizations, including Autoridad Nacional del Ambiente (ANAM) and its National Parks (Soberania, Chagres, Camino de Cruces, and Darien), Autoridad del Canal de Panamá (ACP), Autoridad de la Región Interoceánia (ARI), Fundación Ciudad del Saber, Ecological Police, Comarca Emberá-Wounaan and Tierras Colectivas, Smithsonian Tropical Research Institute, Asociación Nacional para la Consevación de la Naturaleza (ANCON), Summit Zoo, and Patronato Amigos del Aguila Harpía. In Belize we count on the support and partnership of the Ministry of Natural Resources and the Environment, Programme for Belize, and The Belize Zoo/Tropical Education Center.

Major financial support was received from the U. S. Agency for International Development (USAID), Wolf Creek Charitable Foundation, and the Diane A. Ledder Charitable Trust.

Orange-breasted Falcon Project

GOAL

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

Staff

Nadia Sureda and Saskia Santamaria are responsible for the captive-breeding section and Angel Muela and Marta Curti for the field work. José de los Santos Lopez, Noel Guerra, Próspero Gaitan, Bolívar Rodriguez, Omar Fernández, and Edwin Jiménez raise raptor food and provide maintenance of the area and facilities.

Cooperators

Robert Berry assists as a research associate in developing captive-breeding techniques for the species. Financial support is obtained from the Wolf Creek Charitable Foundation.

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

The Orange-breasted Falcon might have as easily been named the Big Footed Falcon based on its very large feet compared to body size. With these large feet, needle sharp talons, and its impressive flight abilities, the falcon preys upon birds and bats near its cliff or treetop eyries. Like all falcons, once it grasps its prey, a quick bite from the notched beak kills instantly, and frequently the falcon accomplishes this even while still in flight. Falcons and other raptors capture their food with no more emotion than humans pick an apple or pull a carrot from the garden. Feeding oneself is a function of life and death, and raptors and humans are at the top of the food chain.

The breeding range of the Orange-breasted Falcon once probably extended from southern Mexico through the tropical forests of much of South America. We have studied the species in Belize, Guatemala, Panama, Colombia, and Ecuador, but the falcon still remains an enigma. Much more is unknown than known about this elusive species that breeds at low densities in typically difficult locations and habitats for study. Most eyries in Panama can only be reached after many days of travel or by use of helicopters and highly technical rope and rock climbing skills.

Of particular interest has been determining the status of this species. Based on our work we now know that the Belize/Guatemala Orange-breasted Falcon population is probably isolated from the population in Panama and South America. We do not know what the conservation consequences of this isolation may be or the status of the species throughout South America. We have studied the falcon's breeding biology and behavior at the eyrie but still know little more during other times of the year or about non-breeding individuals. We also do not know what limits populations. Despite our considerable past efforts there obviously remains a great deal to learn.

To increase our understanding of the Orange-breasted Falcon and safeguard it from possible extirpation from portions of its range, we have established captive populations at both our Neotropical Raptor Center (NRC), Panama, and at founding

Angel Muela

Right: Adult Orange-breasted Falcon at the eyrie.

Below: Angel Muela with nestling Orange-breasted Falcon.

Craig Milner

Peregrine Fund Director Bob Berry's Wolf Creek Ranch facility in Wyoming. Having two colonies greatly reduces the potential for a catastrophic loss of all birds and doubles the opportunity to develop captive-breeding techniques.

2003 RESULTS

In 2003 we re-surveyed known Orange-breasted Falcon nest sites in Panama and many eyries in Belize. In Belize we collected two nestling females to add to our captive population in Panama. To improve observation and management of the captive falcons at the NRC, we installed 12 cameras (two per breeding chamber) for monitoring behavior. Other adaptations also were made to reduce disturbance of the birds and improve the breeding enclosures. In Wyoming, despite having developed a new state-of-the-art facility for breeding these tropical falcons only two years previous, Bob Berry constructed a second captive breeding building with an improved ergonomic design to more closely mimic their natural habitat and to further isolate this sensitive species from disease thought to be carried by other birds of prey.

FUTURE PLANS

We will continue monitoring wild populations of Orange-breasted Falcons and, as possible, expand the searches to locate nests in new areas. A very limited number of falcons will be taken from the wild to round out our captive populations from which we expect to see the first reproduction in 2005 as the falcons reach sexual maturity.

Using small samples of blood from each captive bird, we will genetically compare Orange-breasted Falcons from the Belize/Guatemala populations to birds from Panama. We believe that until recently there has been regular gene flow between these populations and do not expect to find differences.

West Indies Project

GOAL

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

STAFF

This project is managed by Russell Thorstrom.

COLLABORATORS

In Grenada we work in partnership with the Grenada Dry Forest Biodiversity Conservation Project, Grenada Forestry Department, Alan Joseph, Michael Jessamy, and researcher Desmond McQueen. Independent researcher Bonnie Rusk in the United States provided assistance and her expertise.

In the Dominican Republic, independent researcher Jesús Almonte conducted most of the field work in the Los Haitises region. We thank Jim Wiley, United States Fish and Wildlife Service, for his continued advice. We are collaborating with the Dominican Republic National Parks Department that allows Samuel Balbuena de la Rosa to assist Jesús in the field work. We collaborate with Pedro Rodríguez and Carlos Garcia of Fundacion Moscoso Puello, Inc., and Kate Wallace, Pedro Rodríguez, and Eladio Fernández of Sociedad Ornitologica Hispaniola.

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

Financial support for this project was provided by United States Agency for International Development (USAID).

INTRODUCTION

The West Indies islands are volcanic in origin and have had little colonization from continental animals due to the barrier created by the sea and the small size offering a low number of ecological niches for colonizing species. These islands have limited habitat and species diversity but a high endemism or uniqueness of the avian species present. The raptors found only on the West Indies islands of the Caribbean are no exception.

The Peregrine Fund's interest in the West Indies is to understand the problems and help conserve the rare and endangered raptors in this region: in Grenada the Grenada Hook-billed Kite, in Dominican Republic the Ridgway's Hawk, and in Cuba the Gundlach's Hawk, Cuban Kite, and nesting Peregrine Falcons. These island species are more vulnerable to extinction than continental species because their habitat and range are restricted by the size of the islands on which they live.

This project provides up-to-date information on the conservation status and ecological needs of the above-mentioned birds and helps establish new conservation efforts for these species and their environments.

2003 RESULTS

In Grenada, we began in 2000 conducting Grenada Hook-billed Kite surveys throughout the island and found 15 individuals, two nesting pairs, and two pairs exhibiting nesting behavior.

Since then we have located kites nesting in the southern and central interior, a region where kites have never been reported nesting. In 2003, local researcher Desmond McQueen conducted kite surveys and monitoring from June to October. He located seven nesting pairs of which six were successful in producing young to first flight. In August, Russell Thorstrom and Desmond collected blood samples from a nestling. The blood samples were sent to the University of Michigan in December for analysis and to determine taxonomic status. In the four years spent surveying and searching for kites we have located 15 territorial pairs in Grenada.

Russell Thorstrom

Russell Thorstrom

Grenada Hook-billed Kite nestling sitting (relaxed) in its nest.

Right: Desmond McQueen, Grenada Hook-billed Kite researcher, holding a nestling kite.

In Dominican Republic we are focusing on the poorly known and critically endangered Ridgway's Hawk. This hawk was once found throughout Hispaniola, the island containing the Dominican Republic and Haiti, but nowadays it appears to be limited to the northeastern region of the country, especially around the Los Haitises region.

In 2003, from March to October, Jesús Almonte and Samuel Balbuena surveyed for Ridgway's Hawks in the Los Haitises National Park. They recorded 41 territorial pairs of which 28 attempted nesting and seven pairs were successful in fledging nine young. Nine (32%) of the 28 nests were built on top of nesting structures of Palmchats, a passerine endemic to Hispaniola. Two members of Sociedad Ornitologica Hispaniola (SOH) recorded two Ridgway's Hawks on Samana Peninsula, the first time in decades this species has been observed in this region. We have begun collaborating with Fundacion Moscoso Puello, Inc. (FMP) and SOH in creating an educational poster. SOH members visited an area northwest of the capital city of Santo Domingo during one week to investigate potential habitat for the presence of Ridgway's Hawks but none were observed.

In Cuba, we are supporting a Cuban biologist, Pedro Regalado, to conduct surveys and research on the threatened Gundlach's Hawk and nesting Peregrine Falcons. The previous Peregrine nesting site Pedro discovered was checked but no birds were seen. He had information about another possible nesting site from local farmers, but he was unable to confirm nesting activity. He has located three nesting sites for the Gundlach's Hawk in central Cuba and begun observations. Arturo Kirkconnell conducted a brief survey in 2003 for Cuban Kites and found none.

FUTURE PLANS

Surveys and monitoring of the Grenada Hook-billed Kite and Ridgway's Hawk will continue until we have sufficient knowledge to determine their abundance and the most effective conservation interventions for each species. We plan to determine the taxonomic status of the Grenada Hook-billed Kite by genetic comparison with other kite species and races.

With support and direction from FMP, SOH, and the National Parks Department in the Dominican Republic, we are developing a local and national education and conservation awareness campaign for the Ridgway's Hawk and its habitat. We will conduct surveys for Ridgway's Hawks in similar habitat in areas outside of the Los Haitises region.

In Cuba, our local partners are continuing their surveys for the Cuban Kites and research on nesting Peregrine Falcons and Gundlach's Hawks.

Pan-Africa Raptor Conservation Program

GOAL

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

A Cape Vulture soars along the Kransberg cliffs, Waterberg Range, South Africa.

Ron Hartley

The Pan-Africa Raptor Conservation Program identifies priorities and provides direction, coordination, and support for raptor conservation and research projects in Africa and its associated islands. Since beginning in 1990, the program has supported work in Cape Verde, Ethiopia, Ivory Coast, Kenya, Madagascar, South Africa, and Zimbabwe, including support of 25 students at M.Sc. and Ph.D. levels. New information has been collected on 27 species.

2003 RESULTS

Cape Verde Kite Project—The Cape Verde Kite is unique to the Cape Verde Islands off West Africa where it is critically endangered and possibly extinct. In 2001 and 2002 The Peregrine Fund located and captured five kites and translocated them to the National Birds of Prey Centre in the United Kingdom. Upon molecular genetic analyses, however, we determined that these kites may not be the target species, the "Cape Verde Kite." This analysis, conducted by our associate Jeff Johnson of the University of Michigan, measured the genetic relationships between the five captured kites and Black Kites, Red Kites, and Yellow-billed Kites. The five samples presumed to be Cape Verde Kite were identical to two Black Kite samples collected from mainland Africa that were sequenced (mtDNA ND2 sequence, 1041 basepairs). Two specimens from the University of Michigan Museum of Zoology that were labeled as Cape Verde Kite and collected in the 1920s were also sequenced. One, labeled as a potential hybrid, was also identical to the five presumed Cape Verde Kite samples and the two Black Kite samples. The other museum specimen was different at seven nucleotide positions and was genetically closer to Red Kites. The information available so far is not conclusive, but it looks like the five captured kites are either Black Kites or maternal hybrids (given that ND2 is mitochondrial in origin). More samples are needed to verify the unique Cape Verde Kite sequence we obtained from the 1920 specimen in the collection at the university. We are in the process of obtaining additional museum samples from the American Museum of Natural History (AMNH), including the original type specimen used to describe the species, which should help confirm the taxonomy of the captured kites.

Cape Vulture Project, South Africa—Patrick Benson continued his long-term population study of the Cape Vulture at the Kransberg colony, now in its 23rd season of study. The decline in numbers of breeding pairs continued with 618 "occupied" sites (where nest building activities occurred), of which 561 were "active" sites (where an egg was laid). From these sites, 312 nestlings fledged, the second lowest number of successful fledglings in a breeding season since this study began in 1981 (range = 257–578). However, of the nesting attempts resulting in hatched eggs, a higher proportion (84.7%) ended with nestlings fledged than in any other year for which complete data exist during this study (range of previous years = 53.2%–81.7%).

Pat began the third consecutive season of monitoring the Manutsa Cape Vulture colony in June. There were at least 499 active nest sites at this colony this season, a higher number than was observed in either the 2001/2002 (465) or 2002/2003 (455) seasons. This may be due to the earlier visit in this breeding season than was made during either of the previous years, before some nest failures may have occurred. Of the active nests observed in this season, 349 nestlings fledged.

Two sections in books were published and a paper analyzing bones and other materials collected by Cape Vultures was accepted for publication in the journal *Ostrich*. Six presentations were given to bird clubs and other groups concerning this project.

Bale Mountain Raptor Project, Ethiopia—In this study, Simon Thirgood is investigating the regulatory effects of raptor and wolf predation on the Afroalpine rodent communities of the Bale Mountains National Park. Results will assist in planning conservation action for the raptor community, the Ethiopian wolf, and the Afroalpine ecosystem upon which they depend. The project was initiated in October 2002 by two Ethiopian assistants, Anteneh Shemelis and Ermias Admasu.

FUTURE PLANS

We hope to expand our conservation, research, and training opportunities to additional countries in Africa, ultimately to develop raptor conservation capacity throughout the continent and its islands. This depends, however, on support from benefactors. Please see the following pages for further projects and results from this program.

Staff

Rick Watson directs the Pan-Africa Raptor Conservation Program, which is conducted by Ron Hartley, Simon Thomsett, and Munir Virani.

Cooperators

We collaborate with the National Birds of Prey Centre (United Kingdom), Cape Verde Ministry of Agriculture and Fisheries, SEPA (Executive Secretariat for Environment), Instituto Nacional de Investigação e Desenvolvimento Agrário (INIDA), CEAI-Centro de Estudos de Avifauna Ibérica de Portugal, Cape Verde Project Natura 2000, Konrad Lorenz-Institute for Comparative Ethology (Austria), University of the Witwatersrand (South Africa), University of Nottingham and University of Stirling (United Kingdom), and others listed with projects on the following pages. Genetic research is accomplished by Jeff Johnson and David Mindell of the Univeristy of Michigan.

Important financial support for this program was provided by the Disney Wildlife Conservation Fund, Paul Tudor Jones, II, and David Maritz.

Zimbabwe

GOAL

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

The Peregrine Fund began cooperating with and assisting the Zimbabwe Falconers' Club (ZFC) in 1983. This organization has been the primary raptor conservation organization in the region. The falconers have monitored raptor nests, accomplished studies on little-known species, collected data on DDT and other environmental contaminants, studied effects of habitat change on raptors, established captive-breeding populations for endangered raptors, and operated educational programs. This highly successful program has been applied over the past 28 years as a result of a formal agreement between the ZFC and the Department of National Parks and Wildlife Management and the hard work of a group of dedicated falconer conservationists. Their successes can serve as an example for other countries and regions.

2003 RESULTS

Research was accomplished on a variety of topics and species this year. While monitoring the Teita Falcon population in the Batoka Gorge (begun in 1983), an inventory on all raptors was conducted from Victoria Falls to a proposed dam site about 60 km downstream. A project that began in 1999 focused on the role of hyrax as prey on a localized raptor population and continued with the study of six pairs of Black Eagles, three pairs of Crowned Eagles, and four African Hawk Eagles. After two years of intensive fieldwork in the Mtoko area, a nesting pair of the rare Ayres' Hawk-eagle was located. Few nests of this eagle have been found and the only detailed studies were done in Kenya in the 1950s and 1960s by the late famous raptor biologist Leslie Brown. Fifteen nesting pairs of Barred Owls were located in the Karoi area providing insights into nesting behavior of these elusive owls which nest in holes in trees. Many other studies aimed at collecting new information on the breeding biology and ecology of species were also accomplished.

Of special interest are the long-term studies being accomplished that document the effect on habitat and raptor populations resulting from human invasions into pristine areas and previously carefully managed farm lands. Habitat degradation is occurring, but in the short term, and of greater concern, is the direct human persecution on raptors and their nests. Maintaining private nature reserves such as Malilangwe Conservency, that are rich in raptors and other wildlife, is very important for conservation of nature in Zimbabwe.

FUTURE PLANS

We will continue to assist the Zimbabwe Falconers' Club in their raptor conservation and research efforts. The continuing political and social upheaval and uncertainty in Zimbabwe, however, makes it difficult to plan long term.

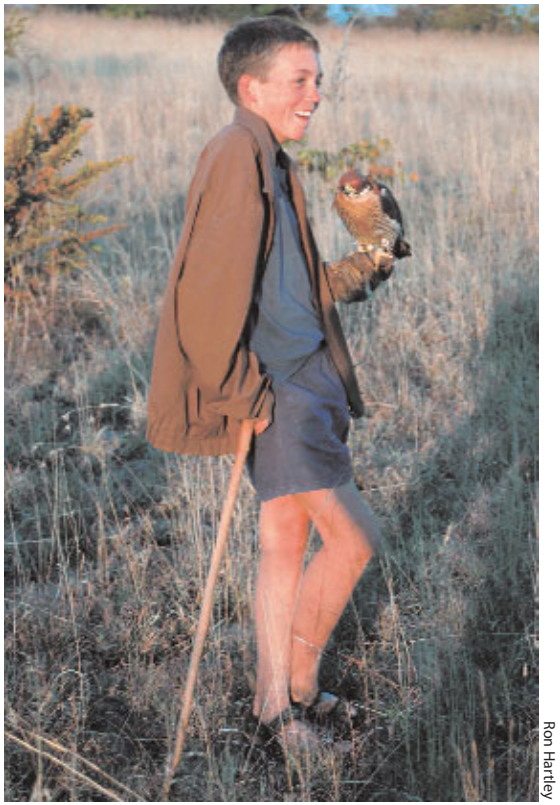
Staff

Ron Hartley manages the Zimbabwe Project.

Cooperators

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

Financial support for this project was provided by Paul Tudor Jones, II.



Ron Hartley

Ron Hartley

Left: Ian Learmonth, tutored in falconry by Ron Hartley, thrives on the hands-on field experience this sport provides.

Right: Crowned Eagles in Save Conservancy where they occurred at high density and typically in Baobab trees. Some pairs now face threats from land invaders.

East Africa Project

GOAL

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

East Africa's rich biological diversity includes at least one-fifth of the world's raptor species. This diversity is intricately linked to a spectacular array of habitats including savanna grasslands, lakes, rivers, forests, and alpine moorlands, many of which are now under serious threat. An expanding human population is putting severe pressure on the environment. Impoverished people are forced to use resources unsustainably, while natural habitats continue to be cleared and converted. Land is degraded and water polluted; ecosystems are damaged and their functions impaired. As a result, raptor populations have severely declined while some species such as Bearded Vultures, Crowned Eagles, and Cassin's Hawk Eagles are in danger of becoming locally extirpated.

Munir Virani

Using light aircraft, Simon Thomsett (pictured) and Munir Virani survey for Rüppell's Vultures breeding on cliffs near Lake Kwenia.

Without concerted and carefully focused conservation actions, East Africa is likely to lose much of its wildlife, including its raptors. Biologists must therefore achieve conservation goals alongside community participation to ensure sustainable results. There is a critical need to understand the state of habitats; which are the most threatened and which therefore require the most urgent attention? By focusing on the ecological needs of raptors in these threatened habitats, we aim to develop scientifically sound conservation strategies to ensure effective habitat management and consequently the survival of raptors.

Simon Thomsett and Munir Virani have been conducting raptor research, training, education, and awareness programs since the project began in 1992. Our primary goal is to monitor population trends of raptors at risk in threatened habitats. Information obtained provides an indicator of the status of raptor populations and need for conservation actions.

Throughout this work, we create opportunities for hands-on research and education and training of students and others to develop local capacity and enthusiasm for nature conservation and science. With support and training of six students at M.Sc. and Ph.D levels, our knowledge of species such as Sokoke Scops Owls, Augur Buzzards, Martial Eagles, African Fish Eagles, and Crowned Eagles has significantly increased over the past decade.

2003 RESULTS

African Fish Eagle—The African Fish Eagle is the quintessential ambassador of aquatic ecosystems in Africa. Horticulture, Kenya's third largest foreign exchange earner, is developing rapidly along the shores of Lake Naivasha in Kenya's Rift Valley and is threatening to alter the shoreline of Lake Baringo, 100 miles north of Naivasha. An exponential influx of human laborers, plus a demand for fuel wood and water, further exacerbates the already fragile state of the lake's ecosystem on which the fish eagle depends. Over the last 10 years, we have closely monitored populations of African Fish Eagles at Lake Naivasha. African Fish Eagle populations have increased from 62 birds in 1997 to between 95 and 100 individuals in 2003 following heavy rains and a ban on fishing since 2000. A 19% immature to adult ratio in 2003 indicated a healthy breeding population despite increases in horticultural and human population growth. We published a paper in the journal *Hydrobiologia* that discusses the factors affecting the species' population dynamics at Lake Naivasha. We also collected data on the fish eagle for a fourth year at Lake Baringo where the population remains stable at 15 territorial pairs.

Crowned Eagle—Kenya's forests are in a desperate state with less than 2% of the country under primary forest. Over the last 10 years we have captive bred and released five Crowned Eagles in Tsavo West National Park. Our goal is to raise awareness of the urgent need to restore and conserve Kenya's forests by using this "forest flagship species" as a conservation and education focus. The species is highly dependent on forests for food and nest trees. With a 60% survival rate, two territories have been established while two released birds have paired up, built a nest, and were observed to copulate.

Gyps vultures—Vultures play a key ecological role in East Africa's savanna grasslands. Being proverbial scavengers, they consume nearly 70% of large animals that die from disease or other causes. Vultures dispose of rotting carcasses and disease-causing organisms and also help maintain the flow of carbon, nitrogen, and other nutrients in the ecosystem.

We began monitoring vulture populations in 2001 in response to the collapse of vulture populations in south Asia. We conducted a second year of field studies in 2003 at Hell's Gate National Park and Lake Kwenia to investigate whether populations of Rüppell's Vultures were declining along the same magnitude as that observed in South Asia. At Hell's Gate, 65 Rüppell's Vultures, including 12 active nests, were observed at the main breeding colony. Breeding success was measured at 0.75 chicks per nest, an increase from 0.4 chicks per nest from the previous year. At Lake Kwenia, 182 Rüppell's Vultures, including 39 occupied nests, were observed in October. Populations of the species at both sites remained stable with no unusually high mortalities observed.

Education, training, and awareness—Raptors at the Athi River Raptor Facility continue to provide inspiration. Over 500 individuals visited the center in 2003. Three raptor identification courses were conducted and a Bearded Vulture video was made and used by Kenya Wildlife Service, Hell's Gate Management Committee, and Elsamere Education Center to inform visitors about the importance of the species. Simon Thomsett successfully negotiated with geothermal power companies to detour power lines at Hell's Gate where collisions with vultures were inevitable. Simon also constructed a raptor-safe waterhole at Hell's Gate. This replaced one that was lethal to raptors, which drowned when they tried to drink or bathe, and will serve as a model for replacing others in Kenya's national parks. We are supporting Paul Kirui, a naturalist based in the Mara Reserve, to locate and GPS raptor nests to determine the birds' spatial and temporal breeding patterns.

National Parks Project - Mara Raptor Survey—The Serengeti-Mara complex is one of the most well-studied ecosystems in Africa except for its rap-

tors, six of which are regionally threatened. The Mara Reserve is the most visited national park in Kenya. Although it is famous for its wildlife and the annual migrations of antelope and wildebeests, rapidly changing land-uses threaten the future of this World Heritage Site. Uncontrolled development of tourist lodges, a growing Masai population, and unabated expansion of large-scale wheat farms close to the reserve's periphery have altered the Mara landscape with obvious impacts on biodiversity. We have conducted three surveys since July to collect baseline information on raptor distribution and abundance along a gradient of different land use regimes. The spectacular large wildlife migration in the Mara transforms the area into an important feeding ground for scavenging raptors across a wider region. Populations of vultures increased 15-fold while those of Bateleurs increased three-fold during the herbivore migration. The adjacent pastoral and agricultural areas typically had fewer species of raptors, mainly Augur Buzzards that are characteristic of rapidly changing human-altered habitats. We believe that our data will contribute importantly towards an overall Mara Management Plan aimed at reducing threats to the Mara ecosystem.

FUTURE PLANS

We have a busy year planned for 2004. (1) Simon Thomsett will collect Bearded Vulture nestlings to establish a captive stock for breeding and release. Despite these vultures regularly hatching two young, only one survives because of siblicide. One nestling can therefore be removed without reducing wild reproduction. (2) We will continue population monitoring and build on existing data from the Rüppell's Vulture and the African Fish Eagle. (3) We will expand our National Parks Project to include more protected areas from where baseline data on raptors will be collected. (4) Crowned Eagle releases will go on as they generate public interest and understanding about the need to conserve forest raptors. (5) We will continue to educate East Africans on aspects of raptor biology through hands-on training and raptor identification courses.

Tony Crocetta

An African Fish Eagle snatches a fish from the water in a spectacular display of dexterity.

Below: Munir Virani sets out at dawn to survey African Fish Eagles on Lake Naivasha.

Tony Crocetta

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, Game Ranching Limited Athi River, Hell's Gate Management Committee, University of Leicester (United Kingdom), Lake Naivasha Riparian Association, A Rocha, Nature Kenya, Heritage Hotels, and the County Councils of Baringo and Koibatek.

Madagascar Project

GOAL

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

INTRODUCTION

Madagascar is the fourth largest island in the world and one of the important biodiversity conservation "hotspots." Twenty-four raptor species occur in Madagascar, and 13 are unique to this large island. Three of Madagascar's raptors are classified as endangered. The Madagascar Serpent-Eagle and Madagascar Red Owl occur in the eastern rainforests where we rediscovered them in 1993 after they were previously thought by some to be extinct. The Madagascar Fish Eagle occurs in western Madagascar's wetlands, rivers, mangroves, and offshore islands where we have pioneered community-based conservation to protect some of the country's last intact wetlands shared by fish eagles and local Sakalava fishermen.

The Peregrine Fund began work in Madagascar in 1990 to help preserve endangered birds of prey, particularly the Madagascar Fish Eagle, Madagascar Serpent-Eagle, and Madagascar Red Owl, and their unique habitat. We have helped create Madagascar's largest national park to protect 210,000 ha of rainforest habitat for these species on Masoala Peninsula. We are providing important information, training, and assistance to other conservation projects, such as the community-based conservation of wetlands, distribution of and threats to Malagasy raptors, and developing local capacity for conservation through local personnel and student training, education, and support.

Part of The Peregrine Fund's Madagascar Project is providing training and experiences 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. Many of these students have completed and published studies on Malagasy raptors and other birds, fisheries, lemur ecology, and ethnobotany. This core group of educated and trained Malagasy people will enable the continuation of work in conservation and biodiversity that we began in the early 90s. We continue to support a Malagasy staff of 24 individuals who are a key component to preserving Madagascar's natural heritage.

Female Madagascar Serpent-Eagle guarding her three-week-old nestling in Masoala National Park.

Russell Thorstrom

2003 RESULTS

We have two major projects in Madagascar. One is in the western central part of the country where the Madagascar Fish Eagle and Wetlands Conservation Project is based around several lakes. This area was recently designated as a Ramsar site under an international treaty for preserving important wetland habitat and biodiversity. We established a research camp at one of the lakes to conduct studies on the endangered fish eagle and work with the local communities in the area. We are assisting in the transfer of control and management of the natural resources to two local charter associations. The local communities have good conservation practices, which will help conserve the endangered Madagascar Fish Eagle and its habitat. This project is setting in place a 1996 law that empowers local communities to create resource management associations. These associations are allowed to control and conserve wetland biodiversity while at the same time meeting sustenance needs of local people on a sustainable basis.

In 2003 we assisted the associations in their completion of delimiting the boundary of their resource management areas that are under their control and jurisdiction. We provided transportation and support to the associations to establish a bank account to manage the collection of fees and payment of expenses for fishing and fish-selling permits. We have also provided material and equipment for the associations to continue low-cost monitoring of fishery and forestry resources. We passed the operation of the tree and plant nursery over to the two associations and continued to provide logistical, material, financial, and technical support.

Malagasy M.Sc. equivalent student Tolojanahary Andriamala finished his second and final field season on the ecology of the Yellow-billed Kite in western Madagascar. He is in the process of analyzing and writing his thesis from his observation of 12 nesting territories. M.Sc. equivalent student Juliot Rama-

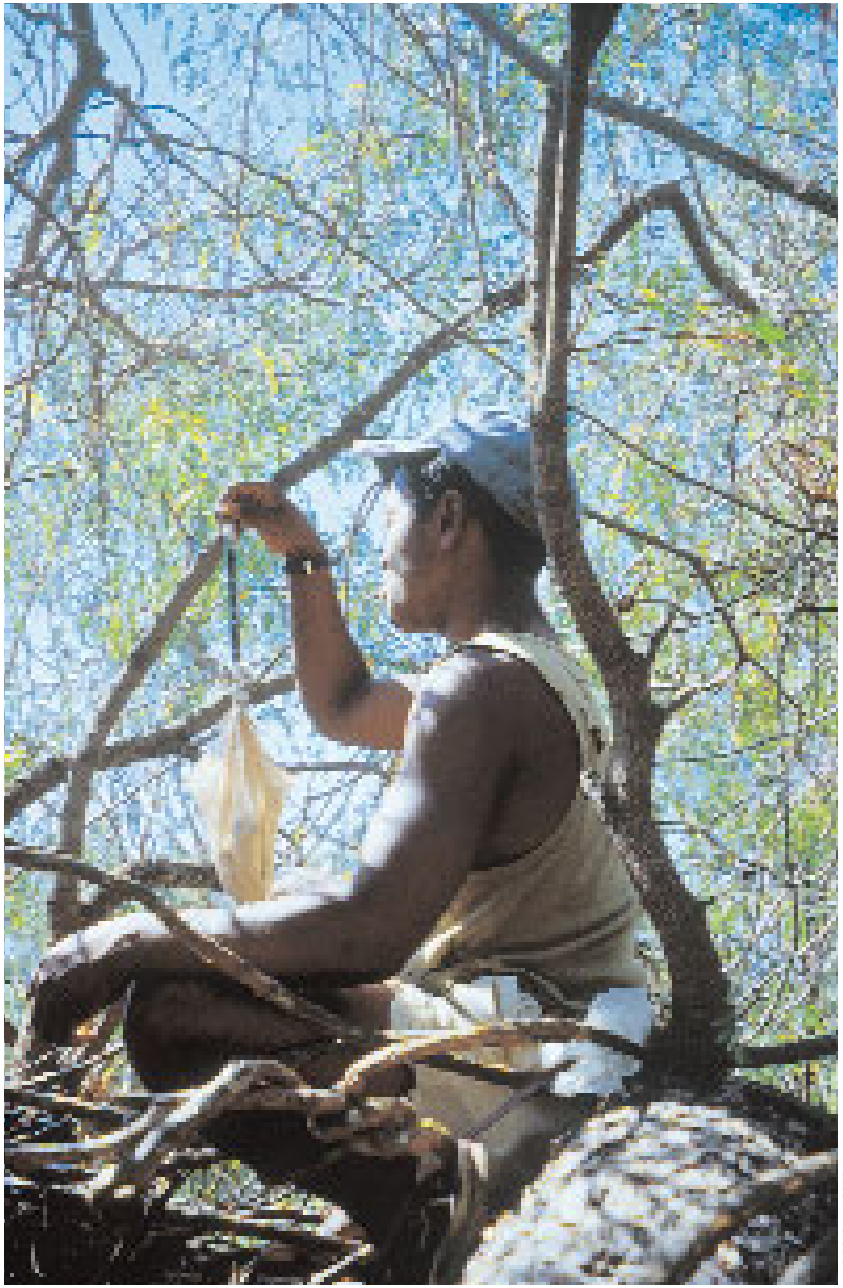
monjisoa began his first field season on the ecology of the recently described Torotoroka Scops Owl in western Madagascar. He located five territorial pairs, banded 11 individuals, and found one nest that fledged two young during his first field season. British doctoral student Ruth Tingay completed molecular genetics studies and is writing her thesis on the unusual breeding behavior of the Madagascar Fish Eagle and the genetic relationship among pairs, off-spring, and extra-pair birds at the nest.

The second project is the Masoala Rainforest Project in the lowland forests of Masoala Peninsula of northeastern Madagascar. This peninsula is a roadless region with one of the largest blocks of intact rainforest remaining in Madagascar. Our aim is to gather basic natural history and ecological information on endangered and poorly-known raptors and achieve conservation. In September 2003, we located the fourth known nesting pair of Madagascar Serpent-Eagles about 3 km north of our research camp, Andranobe Field Station. The nesting pair laid two eggs, both eggs hatched, and one young succumbed to siblicide during its first week. The other young was suspected to have been killed by a Madagascar Harrier Hawk at 30 days of age. Lily-Arison René de Roland continues surveying for and recording the distribution of Madagascar Serpent-Eagles in the remaining forest blocks within the eastern region.

FUTURE PLANS

The fish eagle and wetlands community conservation project is in its final probationary year, and the communities are hoping the national government will award them their first 10-year management period. We will continue to assist the two local associations. We will provide logistical and material support, technical expertise, awareness meetings, conservation directions, and support to the local associations to manage their natural resources that they share with the fish eagles.

We will continue to study Madagascar Serpent-Eagles in the Masoala region and survey in remote rainforest areas to determine the distribution and status of serpent-eagles throughout this eastern region of Madagascar. We will assist students to complete and publish their research on raptors in Madagascar.



Russell Thorstrom

Malagasy M.Sc. student Tolojanahary Andriamalala weighing a nestling Yellow-billed Kite. Tolo is studying the breeding ecology of this kite in western Madagascar.

STAFF

Russell Thorstrom manages the Madagascar Project with Aristide Andrianarimisa, Lily-Arison René de Roland, Jeanneney Rabearivony, Jeanette Ravaoarisoa, and a staff of 20 in Madagscar.

COOPERATORS

We collaborate with the Ministére des Eaux et Forêts (MEF/DEF), Ministére de l'Enseignement Supérier (MinSup), and Ministére de la Recherche Appliquée au Dévelopment (MRAD), Association pour la Gestion des Aires Protégées (ANGAP), Organization National pour l'Environment (ONE), University of Antananarivo, United Nations Educational, Scientific and Cultural Organization (UNESCO), Parc Botanique et Zoologique de Tsimbazaza, World Wide Fund for Nature (WWF-Madagascar), Wildlife Conservation Society, Conservation International, Ranomafana National Park, Projét Masoala, Madagascar Faunal Group, Durrell Wildlife Conservation Institute, University of Nottingham, United Kingdom, and many others.

Financial support for this project was provided by Conservation International-CEPF, Conservation International-Madagascar, Liz Claiborne and Art Ortenberg Foundation, Wildlife Conservation Society, and Ramsar Convention Bureau.

Asia-Pacific Raptor Conservation Program

GOAL

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

Sumiya Ganchuluun

Sumiya Ganchuluun

Nyambayar Batbayar (left) with local herders holding the raptor calendar used to inform Mongolian herders about raptors.

Right: Mark Fuller and Nyambayar Batbayar use radio-telemetry to track Cinereous Vultures.

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

2003 RESULTS

New Guinea Harpy Eagle Project—The islands in the Asia-Pacific region, roughly the area between Southeast Asia and Australia, are notable for their species diversity and urgent conservation needs. There still appears to be time to save most of the unique raptors and avifauna in countries like Papua New Guinea where there is some degree of political stability, local interest in conservation, and relatively low human population density. Developing local capacity for conservation is critical to long-term success.

This project focuses on the New Guinea Harpy Eagle, one of the most poorly-known large raptors in the world. Despite its large size, neither its basic biology nor its present population status are known. From an ecological standpoint, this species is similar to the four other large crowned forest eagles which we are studying on other continents, including the Crested and Harpy Eagles of the Neotropics, the Crowned Eagle of the African mainland, and the Philippine Eagle (through support provided to the Philippine Eagle Foundation). A detailed study of the New Guinea species will clarify its conservation status, generate ecological data of comparative interest to the other species, and also promote local conservation capacity in Papua New Guinea.

In 2003 New Guinea field assistants Smith Asoyama and Amos Hatwara located six New Guinea Harpy Eagle nests from 10 pairs in various stages of the breeding cycle, providing what now amounts to an adequate sample size for further research. In September, Wildlife Conservation Soci-

Philippine Eagle.

Photo courtesy of Neil Rettig Productions, Inc.

ety cooperator Andrew Mack identified New Guinea student Leo Lagra to conduct this study with our supervision and support. We provided a grant to begin his field training and research which is now in progress.

Mongolia Project—This project will improve Mongolia's response to raptor conservation by training a Mongolian biologist in raptor biology who will then work within conservation or science organizations such as World Wildlife Fund-Mongolia or the Mongolian Academy of Science. The research conducted by Mongolian biologist Nyambayar Batbayar as part of his M.Sc. will provide new information on the ecology of the Cinereous Vulture. In 2003 Nyambayar completed required graduate level classes in raptor biology at Boise State University and completed his second and final field research season in Mongolia. He located 202 nests, of which 106 were occupied, in three habitat and land-use areas, including both tree and rock-boulder nests. He wing-tagged 12 vultures in 2002 and obtained five sighting returns from South Korea and Nepal during the 2002/03 winter, providing the first evidence of a winter migration in this species. Nyamba was awarded a grant from the Wildlife Conservation Society for further studies using satellite PTTs to track migrating vultures. This work will be completed after his anticipated graduation in 2004.

In October 2003, Nyamba participated in the Asian Raptor Research and Conservation Network conference in Taiwan, and a meeting in South Korea to enhance raptor conservation and research studies between Mongolia and Korea.

Philippine Eagle Project—The Peregrine Fund annually assists the Philippine Eagle Foundation and we encourage others to do likewise. This is a dedicated group of highly motivated people who each year produce meaningful results for conservation of the Philippine Eagle and raptors in the Philippines. For further information about the organization and their accomplishments write the Philippine Eagle Foundation, VAL Learning Village, Ruby Street, Marfori Heights, Davao City, Philippines, or email at phileagl@info.com.ph and visit their web site at www.philippineeagle.org.

FUTURE PLANS

In New Guinea we will continue to provide support and training to student Leo Lagra for his study of the ecology of New Guinea Harpy Eagles, working alongside Smith Asoyama and Amos Hatwara to find and study this elusive species. Mongolian biologist Nyambayar Batbayar will complete his M.Sc. and return to Mongolia as a specialist in raptor conservation.

We plan to continue to assist the Philippine Eagle Foundation.

Staff

Rick Watson directs this program which is conducted by Martin Gilbert, Munir Virani, and Asim Muhammad.

Cooperators

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

In Mongolia we collaborate with World Wide Fund for Nature-Mongolia and the Mongolian Academy of Sciences. In the United States we work with Mark Fuller, USGS Snake River Field Station and Raptor Research Center, Boise State University, with financial support provided by the Trust for Mutual Understanding.

On the Philippine Eagle project, we collaborate with the Philippine Eagle Foundation and Jim and Joyce Grier.

Asian Vulture Crisis

GOAL

Help prevent the extinction of three species of *Gyps* vulture on the Indian subcontinent.

The discovery that the lethal effect on vultures of diclofenac residues in livestock is responsible for the catastrophic decline in south Asian vulture populations was a team effort, including: back row, from left: Muhammad Arshad, Martin Gilbert, Rick Watson, Lindsay Oaks, and Jamshed Chaudhry; bottom row, from left: Shakeel Ahmed, Munir Virani, and Aleem Ahmed Khan.

File photo

In February 2004 we hosted a Summit Meeting in Kathmandu, Nepal. Speaking at the opening of the meeting, from left: Bashir Ahmed Wani (Government of Pakistan), Hem Sagar Baral (Bird Conservation Nepal), Bill Burnham (The Peregrine Fund), Mohan Bahadur Karki (Government of Nepal), Michael Malinowski (U.S. Ambassador to Nepal), and Asheem Strivastav (Government of India).

File photo

The Peregrine Fund has worked since 2000 to diagnose the cause of the catastrophic decline in *Gyps* vultures in South Asia as a first step in the effort to help prevent their probable extinctions. In 2003 we made a major, first-ever discovery: the cause of vulture decline is from the toxic effects on vultures of a common non-steroidal anti-inflammatory drug called diclofenac.

Our discovery was published in the scientific journal *Nature* on 12 February 2004. Diclofenac is used therapeutically on livestock to relieve pain and inflammation. When livestock die within a few days of treatment with diclofenac, their tissues still contain sufficient residues to be lethal to vultures. Vultures perform an essential ecological role in South Asia by consuming livestock that die and, for religious reasons, are often left for vultures to remove. Sufficient numbers of contaminated carcasses have been available to vultures for over a decade to cause an approximate 30% annual mortality, resulting in an overall decline of about 95% by 2003. This is the first time that a pharmaceutical drug has been demonstrated to cause massive ecological damage with the potential to cause extinctions of at least three vulture species in about a decade.

2003 RESULTS

Our field studies revealed that in 2003 two of the largest known remaining breeding colonies of Oriental White-backed Vultures, with over 1,600 breeding pairs when we began studies in 2000, were reduced to zero. The third major study colony was reduced by 67% to just 162 breeding pairs by November 2003, having declined 50% in just the previous 12 months. This unprecedented rate of decline means that we have a very small window of opportunity to take remedial action to prevent this species' extinction–a matter of months rather than years. Two priority actions were identified:

1. Ensure that governments are committed to removing diclofenac from the vultures' food source and are committed to assist vulture species' recovery, and
2. Immediately collect birds from the wild for future species restoration once the environment is clean. Based on mathematical population modeling and best estimates, we have recommended that at least 25 pairs of each species should be placed in each of at least three separate facilities.

In addition, in October 2003 we conducted field sampling of livestock carcasses to measure carcass contamination rates. This information is needed to help bolster evidence that diclofenac is responsible for vulture declines. Rhys Green from the Royal Society for Protection of Birds (RSPB) and The Peregrine Fund Director Ian Newton developed a mathematical model that demonstrated that fewer than 1 in 250 carcasses available to vultures would need to have been contaminated to have caused the observed decline.

In November 2003 we began testing whether provisioning clean food at a vulture colony could reduce the probability that foraging vultures would encounter a contaminated carcass and die. We tagged six vultures with precision satellite radio tags (Global Positioning System/PTT) that located vultures hourly for a month before provisioning began, during a month of provisioning, and after provisioning. Results showed a reduced foraging range caused by provisioning, suggesting that provisioning may

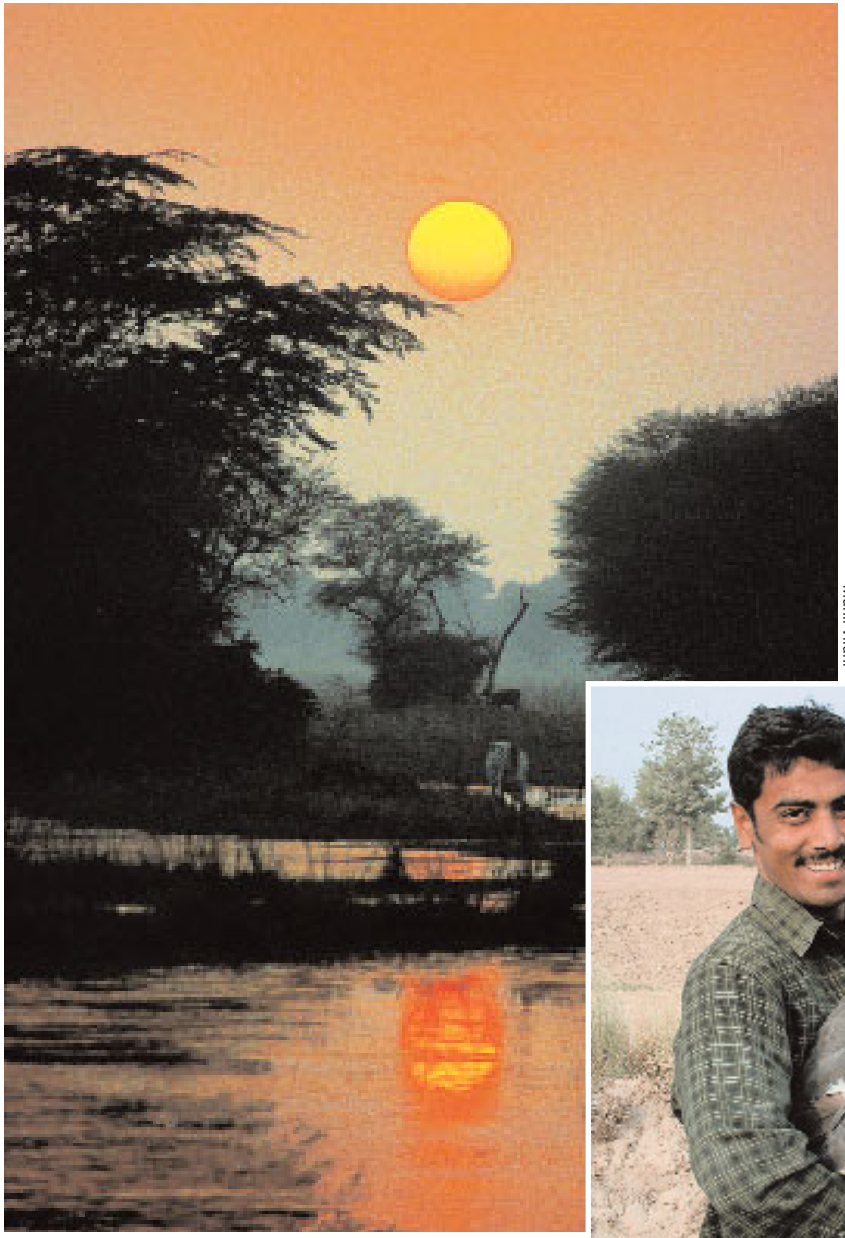
temporarily reduce mortality of breeding vultures from diclofenac poisoning. It may have little benefit for non-breeding birds that wander widely.

FUTURE WORK

With our partners in Nepal, Bird Conservation Nepal (BCN), and with the assistance of the U. S. Department of State, in February 2004 we hosted a Summit Meeting in Kathmandu for government representatives from India, Pakistan, and Nepal to provide them with the scientific evidence for diclofenac as the cause of vulture decline. During a forum the following day, delegates drafted a resolution stating their commitment to control the veterinary use of diclofenac and help restore species. At the same meeting, the Environmental Research and Wildlife Development Agency (ERWDA) from the United Arab Emirates offered to the government of Pakistan (GoP) assistance with species recovery by hosting up to 25 pairs of each of the three species, at least until breeding facilities can be built elsewhere and local staff trained. The Peregrine Fund is working with both ERWDA and GoP to formalize this offer into an agreement and to ensure the safe capture and translocation of up to 70 each of Oriental White-backed Vultures and Long-billed Vultures from Pakistan to Abu Dhabi. An operation of this size, complexity, and urgency will be a challenge requiring the cooperation of many individuals and organizations with the survival of the species as their priority.

Field studies will continue to monitor the survival of vultures at known remaining breeding colonies and we have begun a new effort to find and monitor all remaining vulture colonies throughout the species' ranges across South and Southeast Asia. This project involves the help of volunteers who annually count the number of breeding pairs at local sites and provide the data to us to post for immediate use on our Asian Vulture Population Project web site: www.peregrinefund.org/vulture_project.html

Survival of at least three vulture species is in the hands of The Peregrine Fund and other organizations such as ERWDA, BCN, RSPB, and the Bombay Natural History Society who are working in coordination within India and Nepal with similar goals.



Munir Virani

Martin Gilbert

Student Shakeel Ahmed before releasing an Oriental White-backed Vulture tagged with a GPS satellite radio.

Staff

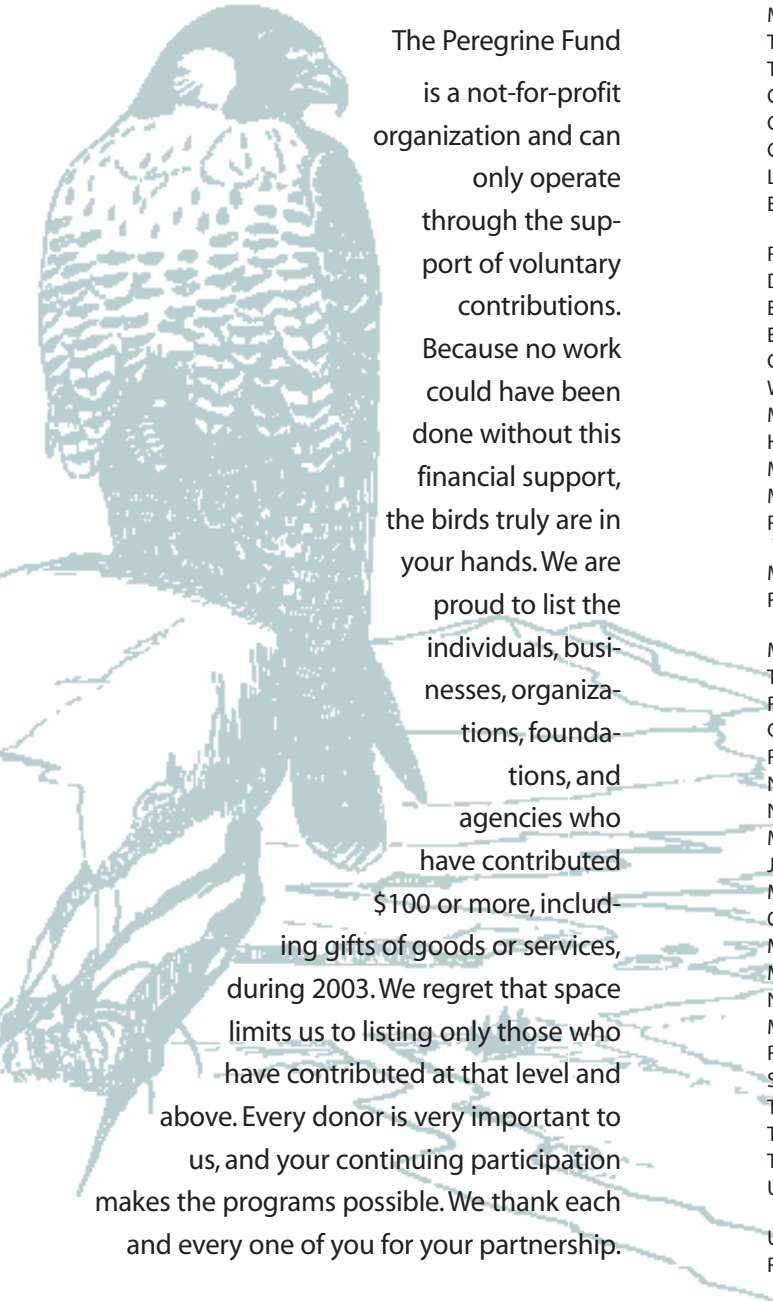
This project is directed by Rick Watson and conducted by Martin Gilbert, Munir Virani, and Muhammad Asim.

Cooperators

Diagnostic analyses were conducted by J. Lindsay Oaks of Washington State University. Genetic research is accomplished by Jeff Johnson and David Mindell of the University of Michigan.

We work in partnership with the Ornithological Society of Pakistan, Bird Conservation Nepal, Environmental Research and Wildlife Development Agency, Royal Society for the Protection of Birds, and Bombay Natural History Society, and rely on the field assistance of Bahauddin Zakariya University students Shakeel Ahmed, Muhammad Jamshed Iqbal Chaudhry, Muhammad Arshad, Shahid Mahmood, and Ahmad Ali. Also assisting the project was John Turner, Assistant Secretary of the U. S. State Department.

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



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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.

2003 Memorial Gifts and Bequests

During 2003 donations were received in memory of the following individuals:

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Mr. Ron Ernst
Mrs. Virginia Hageman
Ms. Stephanie Lynn Hagar
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Mr. Jerry Scott
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Ms. Susan Weller

Donations in memory of Ron Yanke will be listed in the 2004 report.

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)."

$100–199

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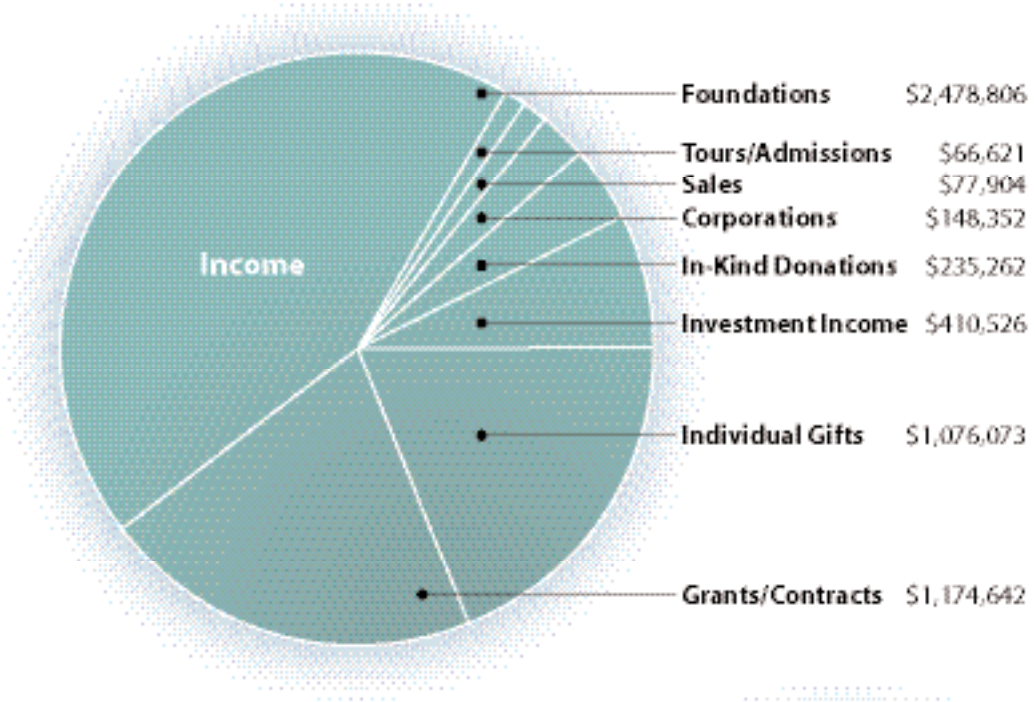
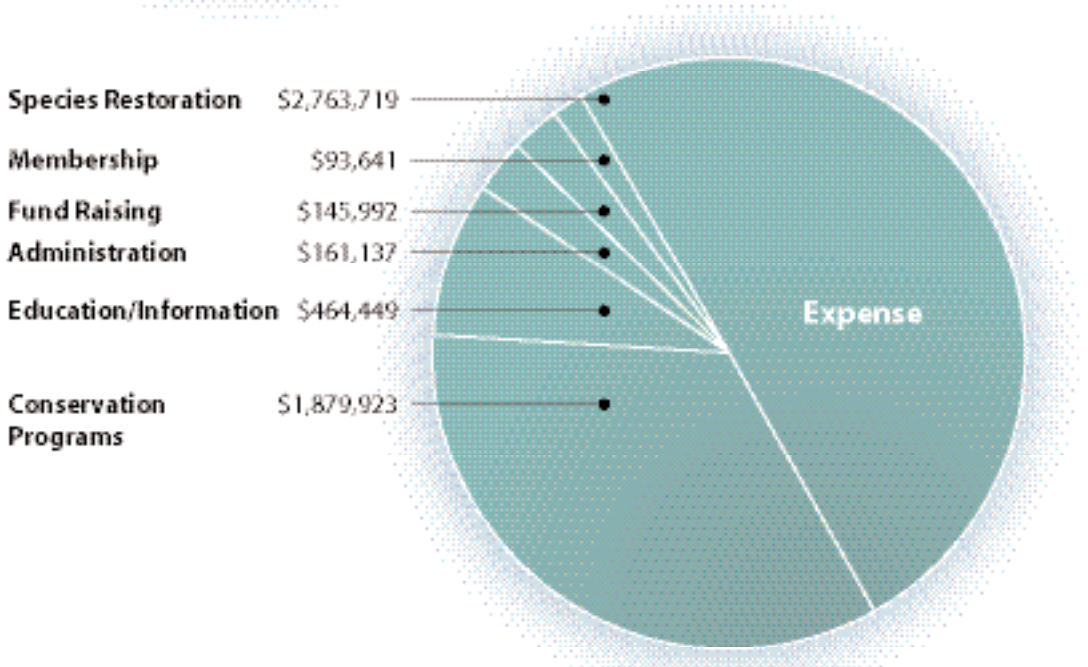
Balance Sheets • 30 September 2003 and 2002

ASSETS	2003	2002
CURRENT ASSETS		
Cash and cash equivalents	$ 973,892	$ 289,792
Merchandise inventory	34,056	34,669
Grants receivable	144,430	191,683
Pledges and other accounts receivable	39,976	549,746
Prepaids and other current assets	49,250	46,696
TOTAL CURRENT ASSETS	1,241,604	1,112,586
PROPERTY, EQUIPMENT AND ARCHIVES		
Land	1,513,000	1,513,000
Land improvements	680,545	719,944
Buildings	4,177,296	3,831,952
Trailers	222,396	168,690
Equipment and vehicles	818,644	1,479,360
Fixtures and displays	640,081	653,301
Construction in progress	0	29,132
	8,051,962	8,395,379
Accumulated depreciation	(2,696,282)	(3,179,225)
	5,355,680	5,216,154
Library	59,160	379,283
Archives	687,652	663,040
	6,102,492	6,258,477
ENDOWMENT ASSETS		
Cash	23,732	35,012
Investments	7,545,897	7,018,126
	7,569,629	7,053,138
	$ 14,913,725	$ 14,424,201

LIABILITIES & FUND BALANCES	2003	2002
CURRENT LIABILITIES		
Accounts payable	$ 194,802	$ 93,135
Accrued taxes and expenses	3,517	8,744
Deferred restricted revenue	93,027	66,361
TOTAL CURRENT LIABILITIES	291,346	168,240
FUND BALANCES		
Unrestricted operating fund	950,258	944,346
Restricted endowment fund	7,569,629	7,053,138
Investment in property, equipment and archives	6,102,492	6,258,477
TOTAL FUND BALANCES	14,913,725	14,424,201
	$ 14,913,725	$ 14,424,201





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

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The Peregrine Fund
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