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THE PEREGRINE FUND

CONSERVING BIRDS OF PREY WORLDWIDE

2012
ANNUAL
REPORT

The Peregrine Fund 2012 Annual Report ©2013
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82 employees worldwide

66 countries worked in since 1970

5.6 MILLION operating budget for 2013

90 advanced degrees earned by students with our support

25,000 publications in our reference library

94 percent of donations spent on programs

2,095 individuals given hands-on training

117 volunteers worldwide

13,939 children toured our visitor center in 2012

184,000 page views per month at www.peregrinefund.org

6,183 raptors produced in captivity since 1970

1,408 books, articles, and reports published

The Peregrine Fund has earned a solid reputation in the conservation community for over four decades. So solid, in fact, that even long-time supporters are surprised to find that we operate with a staff of just 82 people. Even more surprising: we currently manage projects with 34 species in 27 countries.

How has a small staff established such a worldwide presence? Simply put, it's about priorities: 63 of us (77% of the staff) are in the field engaged hands-on with birds of prey. Seven are public educators, and 12 serve members and manage day-to-day business. Each individual conserves birds of prey using a necessary and unique set of skills, but the intimate knowledge gained only in the field makes our organization truly stand out from all others.

Even in my role as President, I spend time in the field collecting bio-samples from Peregrine Falcons to track contaminants from oil spills, pesticides, and climate change. There are myriad examples of our other field work, from building treetop release sites for Ridgway's Hawks to drawing blood from California Condors to test for lead. There's no way to achieve these tasks with a computer keyboard or a committee meeting; somebody has to get their hands dirty, and that's us.

To complete the big picture, the data generated by our fieldwork must be translated into published results and policy recommendations. To do this, we cultivate exceptional individuals who possess both field expertise and academic rigor. To date, we have supported 23 Ph.D. and 67 M.Sc. level scholars. Many of these former graduate student trainees are now among the world's leading experts on birds of prey.

Although we are undeniably unique, I would never claim that we are alone in this work. We partner with literally thousands of people and organizations who share our goals: hunters who voluntarily switch to non-lead ammunition, lawmakers balancing economy and environment, foundations committed to children's education, citizen scientists installing kestrel boxes, pilots carrying young Aplomado Falcons to release sites, members donating every year without fail… I could go on. My point is this: it may take only 82 people to run a world-class non-profit organization, but it takes a world of caring individuals to conserve birds of prey. I thank you for doing your part.

Katherine Elston

Peter and Barbara Jenny **were joined by Devon Elston (center) to collect samples from Peregrine Falcons on the Gulf coast.**

There's no way to achieve these tasks with a computer keyboard or a committee meeting; somebody has to get their hands dirty, and that's us.

Cal Sandfort

As top predators, **Gyrfalcons are a key indicator species illuminating the effects of Arctic climate change.**

Arctic Conservation Alliance

Project Director: *David Anderson*

This project began when we convened an international conference in 2011 on the ecology and conservation of the Gyrfalcon and its prey in Arctic ecosystems. This first meeting of its kind attracted more than 120 scientists from all the circumpolar nations who contributed 70 papers and presentations.

The first lasting legacy of the conference was the publication of the conference proceedings. The conference showed that climate change is measurable, and it is happening more rapidly in the Arctic than anywhere else on Earth. Though Gyrfalcons are not yet endangered, evidence points to diminished populations and breeding in the south of their range.

The second lasting legacy will be a long-term project of Gyrfalcon research and collaboration among scientists from the eight nations of the circumpolar north. Climate models have become more sophisticated over the past 20 years as our understanding of climate science has improved, and predictions are now more certain than ever. These models forecast a 50-60% loss of suitable habitat for Gyrfalcons and their prey over the next 80 years, a time span equivalent to our grandchildren's lifetime.

The Gyrfalcon is one species in an ecological web that will be affected by a changing climate in the Arctic. Our project will focus not only on important Gyrfalcon population parameters, but on the interactions among Gyrfalcons, their prey, and other species of the Arctic tundra. Our research will help prepare future generations to meet the challenge that climate change presents to the survival of many Arctic species.

▼Conference proceedings published

The lasting legacy of our successful 2011 conference "Gyrfalcons and Ptarmigan in a Changing World" was publication of the proceedings, both online and free to anyone in the world with internet access and in print for permanent archive in the libraries of the world. This two-volume, 800-page publication included papers, extended abstracts, and transcripts of 73 presentations and posters given at the conference, and forms a major baseline reference for all future research on climate change effects on Gyrfalcons and ptarmigan in the Arctic.

▼Small grant provided

The Peregrine Fund provided funding for work on north Baffin Island, Nunavut, Canada. As part of a larger project by Arctic Raptors Inc., field staff monitored raptor sites for occupancy and reproductive success on Baffin Island as well as two other study areas (Rankin Inlet, NU and Iglulik, NU). The motivation for the broad-scale survey on Baffin Island was to delineate the highest density of Peregrine Falcons and Gyrfalcons with the goal to further establish the boundary for a long-term study.

The study design proposed three separate areas of study on Baffin Island where 60 sites (20 each) were monitored throughout the breeding season at Milne Inlet, Mary River, and Steensby Inlet. In general, work included surveys by helicopter, boat, and on foot between Steensby Inlet and Milne Inlet from June to August 2012. More than 368 cliffs have been identified as raptor breeding sites along the proposed road and rail corridor from Steensby Inlet in the south to Milne Inlet in the north as part of mining operations associated with the Baffinland Iron Mine. Of these, 317 were surveyed. Raptors occupied 131 sites, while the remaining sites were unoccupied. Eighteen unique nest sites are known to have been used by Gyrfalcons.

Nest sites located in the Steensby Inlet area were monitored more frequently and biologists confirmed that raptors in this area experienced poor reproductive success. A total of 54 Peregrine Falcon nests were documented, compared to 75 in 2011. There were 74 Rough-legged Hawk nests documented, which was very similar to the previous year. Despite surveying the region earlier (8 June) and for an additional six weeks, only three Gyrfalcon nests were found compared to seven in 2011. Only one Gyrfalcon site was successful, producing a single chick. Four Gyrfalcon nest sites previously classified as unique locations were reclassified as alternates resulting in 18 unique sites.

A total of one Gyrfalcon, 34 Peregrine Falcons, and 20 Rough-legged Hawks were banded. One adult Gyrfalcon and one adult Peregrine Falcon banded in 2011 were re-encountered. There were no Snowy Owls recorded breeding in the region and no Long-tailed Jaegers recorded breeding in the Regional Study Area.

...climate change is measurable, and it is happening more rapidly in the Arctic than anywhere else on Earth.

Poor reproductive success was likely due to high rainfall in all study areas. For example, in the Coxe Islands west of Iglulik, 149 mm of rain was recorded compared to 35 mm and 22 mm in 2010 and 2011, respectively. At Rankin Inlet, 126 mm of rainfall was recorded for the summer, which included a storm that saw 46.7 mm precipitation in a 24-hour period on 13 and 14 July when most clutches were hatching.

No lemmings were trapped on the 678 trap nights conducted at Iglulik and the 600 trap nights at Rankin Inlet. Lemming abundance on Baffin Island was significantly lower than in 2011 and reflects the absence of Snowy Owls and jaegers breeding in the region. Avian distance sampling indicated that shorebird abundance was much reduced.

Mining operations usually begin in early June each year, which prevents early season occupancy surveys for Gyrfalcons. As a result, it is suspected that early season reproductive failure may partly explain low occupancy rates, and logistics are being investigated to address this shortfall by putting field crews into the area one month in advance of the start of mining operations.❖

Wind Energy Impacts on Raptors

Project Director: *Rick Watson*

"As the United States moves to expand wind energy production, it also must maintain and protect the Nation's fish and wildlife, and their habitats, which wind energy production can negatively affect. As with all responsible energy development, wind energy projects should adhere to high standards for environmental protection. With proper diligence paid to siting, operations, and management of projects, it is possible to mitigate for adverse effects to fish, wildlife, and their habitats. This is best accomplished when the developer coordinates as early as possible with the Service and other stakeholders. Such coordination allows for the greatest range of development and mitigation options."

— U.S. Fish and Wildlife Service, Land-based Wind Energy Guidelines, 2011

The wind energy guidelines are founded upon a tiered approach for assessing potential adverse effects to wildlife species of concern and their habitats. This approach is a decision-making process for collecting information in increasing detail. It quantifies the possible risks of proposed wind energy projects to wildlife species of concern and habitats and evaluates those risks to make site location, construction, and operation decisions. Subsequent tiers refine and build upon issues and efforts in previous tiers. At each tier, a set of questions is provided to help the developer evaluate the potential risk associated with developing a project. This guides a wind developer's decision about whether the selected location is appropriate. This decision is related to site-specific conditions regarding potential species and habitat effects.

The Peregrine Fund is assessing the impacts of a new wind energy site near Boise that was built next to one of the nation's largest known concentrations of nesting raptors.

Southwest Idaho **is a mosaic of farmlands, mountains, and desert, bisected by the Snake River and home to one of the nation's largest known concentrations of nesting raptors.**

Rick Watson

▼Mountain Air Wind Energy Project results

Construction of 60 wind turbines by the Mountain Air Wind Energy Project was already well underway when The Peregrine Fund was invited in June 2012 to conduct pre-construction assessment and monitoring of raptors in the area. Construction was completed during August and September 2012, and turbines were activated upon completion.

The Peregrine Fund located and used existing reports, studies, and databases, and conducted field studies to accomplish the following tasks to the extent possible in the time available:

- Landscape level assessment of habitat for species of concern.
- Assess presence of species of concern.
- Assess presence of critical congregation areas for species of concern.
- Conduct reconnaissance and field study site visits by biologists.
- Help the wind energy project communicate results of site visits and other assessments to the U.S. Fish and Wildlife Service (Service).
- Discuss the extent and design of further field studies needed with the Service.
- Evaluate risk to species of concern from project operation.
- Identify ways to mitigate potential direct and indirect impacts of operating the project.

Given the late stage of the raptor breeding season and the advanced status of construction on the Mountain Air Wind Project, the extent and scope of monitoring and assessment was limited by time. Our objective was to gather as much information as possible and present it in a form that lays out a sound, science-based:

- Evaluation of risk to species of concern.
- Mitigation measures to consider (if needed).
- Course of post-construction mortality assessment and monitoring.

A Burrowing Owl surveys the high sage desert above the Snake River.

Russell Thorstrom

Biologists used a chartered helicopter to conduct aerial surveys... with emphasis on the most likely nest and roost sites.

▼Bird and bat surveys

Biologists were deployed on the ground over the course of the summer to look for birds and bats using standard visual and aural survey techniques along roads, tracks, and on high vantage points. Observation of behavior was used to help identify nest, roost, and foraging sites of species of concern and map their associated habitat features.

▼Aerial surveys

Biologists used a chartered helicopter to conduct aerial surveys within a 10-mile radius of the project site for nesting Golden Eagles and other raptors and large birds, with emphasis on the most likely nest and roost sites along rivers, cliffs, and rock outcrops and on power transmission towers.

▼Databases

Biologists accessed existing databases on raptors nesting in the area, which proved to be extensive and very detailed as a result of the 40-year study of raptors in the Snake River Canyon by Kochert and Steenhoff.❖

California Condor Restoration

Project Director: *Chris Parish*

Since 1996, we have worked with state and federal agencies, tribes, local communities, and private partners to establish a self-sustaining population of California Condors in Arizona and Utah.

We produce condors in captivity at our World Center for Birds of Prey and release them to the wild at Vermilion Cliffs National Monument north of the Grand Canyon. Some of the eggs and birds produced in Idaho are exchanged with other facilities to ensure maximum genetic diversity in the total population, which now numbers more than 400 birds.

The condor population has grown substantially since 1982 when only 22 of the huge birds remained on Earth. This success is due to captive breeding, release, radio-tracking, and adaptive management. Our daily monitoring and published data have contributed significantly to the scientific knowledge related to this iconic species.

Lead poisoning continues to be the leading cause of diagnosed death in condors and the primary obstacle to condor recovery. Our research provides solid evidence about the source of lead and ways to reduce its impact. We are working with game management agencies in Arizona and Utah to limit the chances that condors will consume small fragments of lead in the carcasses and gut piles of deer and other shot animals.

We believe that voluntary action by hunters and others is the best way to overcome this problem. Awareness and education are our best tools for building a wider understanding of what has long been a hidden threat to wildlife. With less lead in the landscape, we are confident that condors will thrive in the wild once again.

▼Results

California Condor Propagation

Of 59 captive California Condors in Boise, 40 are adults: 18 breeding pairs, three Condor Cliffs display birds, and a mentor bird for juveniles. In addition, there are four juveniles from the 2009-2011 breeding seasons and 15 chicks hatched in 2012. Of the four juveniles, two are being held for the captive breeding program and two are being held for release in California and Arizona in 2013. Ten juvenile condors reared in Boise, five juveniles reared in Oregon, and one adult condor were transferred from our facility to field sites in California and Arizona and to breeding and display facilities at Los Angeles Zoo, Santa Barbara Zoo, and San Diego Zoo Safari Park.

Eighteen female condors produced 22 eggs with 21 fertile. Of the fertile eggs, 15 stayed in Boise, four were sent to the Los Angeles Zoo to be placed in wild nests in central and southern California, and two were sent to the Oregon Zoo to assist in successful pair bonding. Seventeen of the 21 fertile eggs hatched successfully. In exchange, three fertile eggs were transferred to Boise from the Los Angeles Zoo and all hatched successfully, bringing the total number of chicks reared in Boise to 15.

We successfully double-clutched two of our most genetically valuable pairs and two additional pairs to replace infertile and early dead eggs. In Boise, we had 95.5% fertility, 83.3% hatchability, and 100% chick survival. Of all eggs produced in Boise, we had 95.5% fertility, 81.0% hatchability, and 100% chick survival. All 15 chicks hatched at this facility were parent-reared. One chick in Boise has been reared from four days of age by a single adult female after her mate was removed for aggressively attacking her while in the nest box with the chick.

As they have since 2003, the adult condors in Boise were vaccinated against West Nile virus. We began trapping all condors that had not received a vaccine booster within the last two years and administered the Merial Recombitek Equine West Nile Virus Vaccine. We plan to continue to vaccinate the adults annually.

In accordance with the protocol established in 2009, each condor chick was vaccinated at 30 days of age, given a booster at 60 days of age, and blood was drawn for titer testing between 90 and 120 days of age. An additional booster was administered immediately after the blood sample was obtained between 90 and 120 days of age.

We depleted our supply of DNA plasmid West Nile Virus vaccine that was formulated by the Center for Disease Control and had to be stored in super-cold storage at the biology department on the campus of Boise State University. We will vaccinate and booster all condor chicks with the Merial Recombitek Equine West Nile Virus Vaccine from this point forward. Also, an aggressive mosquito abatement program continues to be maintained at the Boise facility.

A few changes were made to improve the facility and behavior of the condors. All existing condor breeding chambers were repaired to secure the chain link to the framework at ground level where time and erosion had exposed holes and pathways for skunks and badgers to enter chambers. Continued work was done with the addition of a 10,000-gallon-capacity pump on the large pool in the socialization pen that was installed two years ago that is changed and cleaned remotely from inside of the barn.

New cameras and a DVR were pur-

continued on page 10

Chris Parish

Lead exposure and mortality

Our research has included observations of lead pellets and fragments in the digestive tracts of lead-poisoned condors and the discovery of bullet fragments in rifle-killed deer and coyotes fed on by condors. Radiographs of the remains of deer killed with standard lead-based rifle bullets have revealed numerous fragments as the normal condition.

The Peregrine Fund continued to focus on lead exposure detection and treatment as the essential element in maintaining the population. Since 2000, we have trapped, obtained blood for lead-level analysis, and treated when necessary.

With the aid of both GPS-satellite telemetry and ground tracking VHF telemetry, we again found an abrupt increase of blood lead-levels in condors corresponding with increased foraging in hunting areas on the Kaibab Plateau in northern Arizona and the Kolob range in southern Utah in the weeks prior to testing. The period of highest exposure is October and November when the deer hunting seasons are underway, and the period of greatest lead-caused mortality among condors is December and January, reflecting the latency of effect.

We collected 95 blood samples (including re-samples), representing 71 of the 75 condors in the wild at the time. Forty-two (59%) of the trapped birds showed lead levels indicative of lead exposure (≥15 µg/dl), down from 49 birds the previous year. Fourteen individuals (20%) revealed lead levels greater than 65 µg/dl, and 18 condors were treated with chelation therapy, down from 19. Note that four of the samples represent exposure events outside of the normal lead-related events occurring after the fall hunting seasons. Condors 123M95 and 297F03 were treated in July and June, respectively, suggesting their exposure event occurred in the months prior to testing.

The treatment threshold for chelation continues to vary from year to year in an effort to reduce mortality of birds that have been continually exposed for numerous years. Each individual case of lead exposure is independently diagnosed and based not only on blood-lead level but on body condition, frequency of previous known exposures, nesting activity, and other variables. Numbers of birds treated from year to year may therefore not be as indicative of the severity of seasonal exposure as are the toxic blood-lead levels observed through sampling.

We collected four dead birds between February and June of 2012 in time to perform necropsies to determine lead toxicosis as the cause of death. Two additional birds went missing and were added to the missing and assumed dead category, and three died of predation (1 eagle, 2 coyotes). The timing of the disappearance of one of the wild-hatched chicks coincided with multiple Golden Eagle-condor encounters, two of which resulted in injured condors that were rehabilitated and released. The recent increase in negative condor-eagle interactions is likely due to the relocation of a resident pair of eagles near the release site.

Breeding summary

Proven breeding pair 114M95 and 126F95 produced an egg on 7 February 2012, the earliest egg produced by the Arizona flock. The chick, 659, was first observed on 7 May. The previous day, we had observed Golden Eagles stooping the parents while they stood at the entrance to the nest cave. Predation by eagles may have contributed to the disappearance of the chick, last seen 21 July.

Condor 158M97, who lost his previous mate in 2010, re-paired with Condor 346F04, who laid an egg in a canyon on the Kaibab Plateau. The attempt failed for unknown reasons just eight days later.

Condors 162M97 and 368F05 were observed in what might have been trio activity with 388M05 but no evidence of cave selection or egg laying was documented.

Condors 266M02 and 296F03 were observed investigating caves and suspected to have produced an egg but failed to produce a viable chick. Eggshell fragments were collected below the nest cave but no further information was available.

Biologists treat Condor 299 **for lead exposure during the 2012 breeding season.**

Condors 187M98 and 133F96 produced chick 660 in the Grand Canyon National Park, South Rim on the west-facing wall of Bright Angel Canyon. Regular visuals on the chick were documented and the chick was expected to fledge. This same pair produced chick 633 the previous year and chick 476 in 2008.

Condors 257M01 and 393F05 exhibited paired behavior but no nest cave selection or egg laying were documented.

Condors 273M02 and 302F03 were observed in a cave in the Glen Canyon Recreation area upriver from Lee's Ferry. The pair later abandoned the area, suggesting that they had failed to produce a viable egg.

Condors 299M03 and 343F04 exhibited behavior suggestive of nest-searching and egg laying, but abruptly abandoned an area within Zion National Park and returned nearly directly to the Vermilion Cliffs release site. Condor 299M03 was trapped and found to have extremely high blood-lead levels requiring treatment. Condor 343F04 also was trapped and held with 299M03 in an attempt to maintain their pair bond.

Having lost her two previous mates, Condor 210F99 paired again, this time with Condor 287M02, resulting in her third chick (674). The chick was produced in Tapeat's Canyon, deep within the Grand Canyon. The chick was visually confirmed, but due to the remote location of the nest, observations were few and far between. After several attempts to obtain visual observations without success, the nest was deemed failed.

Condors 123M95 and 297F03 exhibited behavior suggestive of being paired, but it wasn't until later that we understood what might have prevented them from producing — both were treated for toxic levels of lead. It is unclear whether this evidence of exposure affected their breeding success, but similar to many cases over the years, the effects of lead exposure may reach beyond simple cases of poisoning and observed lead-caused death.

chased to be installed in the socialization pen but installation had to be postponed due to the need to hold back two condors that will be released in 2013. We continued the process of improving and repairing the video and camera equipment used to observe the condors in the breeding chambers. New cameras and DVRs were purchased and installed in the Condor Cliffs display and the breeding chambers.

The Condor Cliffs display was renovated to add an opening and tunnel for the condors in the "cliff" wall to enter a trap/holding/feeding room created in the existing building attached to the display. Perching, substrate, heat panels, and a trap door were added to the room.

A 10 kW air-cooled propane generator with automatic transfer switch, heat pack, and 120-gallon propane tank was installed at the condor incubation facility. The generator turns on and powers the incubation facility automatically after a power outage and has enough kW to operate and maintain the proper heat and humidity of all condor egg incubators and chick brooders in use.

An Ecolab Energy Star sanitizing dishwasher was purchased and installed in the incubation facility to improve incubation sanitization and save an estimated 695 gallons of water during the incubation period. Another improvement to our incubation facility was the purchase and use of a UV sterilization lamp and wand to replace annual incubator fumigation. In addition, ongoing repairs were made to leaking and damaged pipes in the existing monitored fire protection sprinkler systems in the breeding barns.

Release

We transferred six captive-bred condors (three females and three males) to the flight pen at the Vermilion Cliffs release site. All were from the 2011 cohort. There were 81 condors free-flying in Arizona.

Prior to release, candidates were housed in a 60-by-40-foot flight pen where they were monitored and evaluated before being deemed fit for release. Approximately two weeks before release, each condor was fitted with patagial (wing-mounted) number tags and a pair of patagially-mounted, sometimes retrix-mounted, radio transmitters produced by Advanced Telemetry Systems, Holohill Systems, Microwave Telemetry, or Merlin Systems. The transmitters were either conventional Very High Frequency (VHF) or Global Positioning System (GPS/PTT) instruments. In all, we released 16 condors during the reporting period, the largest number of birds released in a single fiscal year.

We continued to provide contaminant-free food on the average of every three days at the release site in the form of dairy calf carcasses. We intensely monitored newly released condors and aggressively hazed them away from unsafe roosts in an attempt to avoid pre-

Field technician Erin Brannon observes California Condors just after a release.

Chris Parish

dation by coyotes. Despite our efforts, we observed three deaths from predation (two coyote and one eagle).

Although condors have gone missing in the past, we always hope they will one day return, just as Condor 176 reappeared after being out of contact for nearly five months. This year, however, we added two wild-hatched condors to the "missing and/or unknown" category, which now totals 24 individuals. The ever-increasing independence and utilization of habitats in Utah by the condor flock, combined with the large amounts of inaccessible private property, continue to increase difficulty in tracking and monitoring condor behavior there. We therefore rely on our increased knowledge from our years of study and adaptive management.

▼Wild reproduction

Twelve pairs were observed: two were tending young from the previous year and 10 exhibited breeding behavior. Three of the latter were confirmed incubating within their respective nest caves and were later confirmed to contain viable young. In all, we have observed 18 wild-hatched young since 2003.

▼Monitoring of population

Our biologists and field workers tracked the daily movements and activities of condors, a task made more difficult by the increasing numbers of free-ranging birds and their widening tendencies toward long-range movement in this rugged region of limited access. We continue, therefore, to benefit from satellite-reporting PTT/GPS transmitters (Microwave Technology) on selected condors. These transmitters record hourly position fixes to within roughly 50 meters of the actual locations and transfer accumulated data each day to orbital satellite arrays. The technology was especially useful in the case of increasingly self-sufficient condors that failed to regularly return to the release site, as is now the case for many.

Six individuals wore PTT/GPS transmitters; we selected these condors on the basis of their representation of flock movement or other considerations important to management. We were able to map entire sequences of movement by GPS-equipped condors; for example, when pairs were forming or later prospecting for nest caves, or when they made incubation exchanges. The transmitters were especially valuable in revealing locations of condor concentration and prolonged activity in canyon regions that were difficult for us to access and remote private lands of southwestern Utah. We used the transmitters to locate areas of foraging, especially in connection with lead exposure.

We continued to see what has become the normal trend of extended use of Utah, the northern end of the condor's home range. Most of the birds eventually returned from the hills just outside Zion National Park to the release site as the winter snows made carrion more scarce. This period is characterized by an increasing use of the Kaibab and Paria plateaus where condors have continued to encounter lead bullet fragments in the remains of shot deer, coyotes, and marmots. GPS transmitters have been especially valuable in revealing the exact locations of condor activity both in real time and in retrospect.

Close monitoring of movements also aided us in quickly averting behavioral problems that still occasionally develop among inexperienced condors. We continued to condition them by hazing, installing aversive conditioning devices in highly used areas when necessary, and confinement for extreme cases. These measures are intended to break patterns of undesirable behavior in relation to humans and artificial structures. Our records show that such conditioning results in improved behavior as the birds mature. We continued our public education and outreach efforts in areas where condors and humans overlap.❖

Aplomado Falcon Restoration

Project Director: *Brian Mutch*

The Northern Aplomado Falcon was once part of a dynamic wildlife community in the southwestern United States and in Mexico. Common in the early 1900s, the species disappeared from the Southwest by 1930 as people converted wide-open grasslands—the birds' habitat—to farms, towns, and other uses. The last known breeding pair in the United States was observed near Deming, NM, in 1952; the bird was put on the Endangered Species List in 1986.

Over two decades, The Peregrine Fund has successfully restored a small but thriving number of Aplomado Falcons in South Texas by releasing birds produced in captivity at our World Center for Birds of Prey. We also have released falcons to the wild in West Texas and New Mexico with mixed results, possibly due in part to persistent and extreme drought in the region.

Habitat that is good for the falcons is good for the survival of other animals, plants, and insects. To promote biological diversity, our Safe Harbor program in Texas has opened more than 2 million acres of otherwise inaccessible private land for the recovery effort. In New Mexico, a 10 (j) experimental, non-essential designation extends beyond private land to areas managed by federal and state agencies.

Adaptive management is a necessary tool in today's landscape. Artificial nests that use our innovative anti-predator design have improved nesting success and productivity.

Each year brings us closer to our goal of removing the Aplomado Falcon from the Endangered Species List.

▼Results

We released 67 Aplomado Falcons from three sites in New Mexico and two sites in Texas. Of those, 73% survived.

In New Mexico, 32 falcons were released on land administered by the Bureau of Land Management, White Sands Missile Range, and Armendaris Ranch. Releases were made under the 10(j) Rule, which designates the birds as a "Nonessential-Experimental Population."

In Texas, 35 falcons were released at two sites at Mustang Island State Park. This was the first release of captive-bred falcons on the Texas coast since 2004 as an effort to populate suitable habitat between two existing coastal falcon populations.

LightHawk and its team of volunteer pilots (Richard and Sandi Hoover, Carl Mattson, and Tom Haas and Janice Newman) safely transported falcons from our breeding facility in Boise to New Mexico and Texas, greatly reducing the stress on the falcons from extended travel time.

▼Telemetry study

As a follow-up to our 2011 study, seven female falcons released in New Mexico and seven female falcons released at Mustang Island State Park were fitted with satellite PTT transmitters in an effort to further understand falcon survival and dispersal in these environments.

Within a few days of being released, one falcon was lost to predation at both the White Sands Missile Range site and at the Mustang Island release site. The two PTTs were recovered and redeployed on falcons released in New Mexico. All the New Mexico falcons with PTTs were eventually presumed lost as fatalities. Two South Texas falcons with PTTs are being monitored and moving about 35 miles north and 35 miles south of the Mustang Island release sites. We will continue to monitor the movements and fates of these falcons.

▼Aplomado Falcon monitoring

We continued to focus our survey efforts in South Texas on determining occupancy at all known territories. We observed a total of 73 falcons, including 28 territorial pairs and 15 individuals. In all, we surveyed 44 territories in South Texas, of which 64% were occupied.

Of the 19 territories in the Matagorda Island National Wildlife Refuge survey area, 68% were occupied. In the Laguna Atascosa National Wildlife Refuge area, 60% of territories surveyed were occupied. Overall, these results reveal a decline in occupancy from that observed the previous year. Moreover, we observed several unpaired adult female falcons at nest sites, particularly in the Laguna Atascosa area. This problem is becoming persistent and warrants investigation.

In addition to observing an increase in territories with lone females at nest sites, we continued to see juvenile males paired with adult females. While this illustrates recruitment of males into the breeding population, it also demonstrates a lack of available non-breeding adult males.

Even though the area continued to suffer from drought conditions, prey in the form of small birds and insects, such as cicadas, still seemed to be in ample supply. The Gulf Coast of Texas is rather amazing in its ability to support such a resource of prey for the falcons even in such tough conditions.

While prey availability was not a concern in southern Texas, we found that loss of habitat to brush encroachment and potential development is a major concern in the Laguna Atascosa National Wildlife Refuge study area. The two most common woody plant species responsible for the encroachment are mesquite and huisache and could be closely related to the territory occu-

pancy problems we are seeing in this part of Texas.

Fortunately, the refuge has begun work to clear mesquite and huisache and re-open the grassland habitat in one of the falcon territories on the Bahia Grande Unit. This is a great step forward, but much more work will need to be done throughout the study area to effectively improve the falcon's position on the landscape. The U.S. Fish and Wildlife Service is aware of the need for this habitat work and is beginning to make a presence for the falcon. We hope that in short order the size and scope of the habitat improvement projects will grow and have a positive impact on the falcon in southern Texas. We have been advising staff at the Laguna Atascoa refuge and the Ecological Services office in Corpus Christi on where habitat improvement projects are needed.

Most of the pairs observed at some point during the occupancy survey were incubating eggs or brooding young. In the Matagorda and Laguna Atascosa areas, the other pairs were, at the very least, observed at a nest site or territory and hunting cooperatively, copulating, etc.

For the first time since 2006, we returned in early June to band and take blood samples from nestlings in the Laguna Atascosa and Matagorda areas and collect productivity data from all of the territorial pairs observed during the occupancy survey. The results were encouraging with an observed productivity rate of 1.7 young/territorial pair for the coastal Texas population. The total number of nestlings observed was 48.

A young Aplomado Falcon **released at the Armendaris Ranch in New Mexico perches on a yucca stalk within site of the hack box.**

Paul Juergens

We banded 28 nestlings and collected 29 blood samples from the nestlings for genetic analysis. Addled eggs and egg shell fragments also were collected and will be used in ongoing contaminant studies. We also documented four nest failures. Overall, the observed productivity rate is very encouraging and further shows the effectiveness of the nesting structures in ensuring falcons are able to successfully nest in this population.

We also conducted nesting surveys in the Chihuahuan Desert area of west Texas and New Mexico. During spring surveys in 2009, we had located 10 breeding pairs of falcons in these new recovery areas, but the 2010 survey efforts indicated a loss of eight of those pairs in West Texas. In 2011, surveys revealed just one nesting pair in West Texas that managed to fledge two young and one pair in New Mexico that fledged three young. The 2012 falcon surveys revealed no nesting falcon pairs in West Texas or New Mexico and only one individual adult falcon in each area, providing strong evidence that recovery of the Aplomado Falcon in the Chihuahuan Desert is unlikely.

The results were encouraging with an observed productivity rate of 1.7 young per territorial pair for the coastal Texas population.

Aplomado Falcon chicks released at Texas state park for first time

On 1 July 2012, biologists began releasing Aplomado Falcons to the wild for the first time at Mustang Island State Park.

"We are delighted to have Mustang Island State Park as a partner in this recovery effort," said Bill Heinrich. "The park helps fill in a gap between falcon populations that are already well-established and self-sustaining in South Texas."

Since 1984, The Peregrine Fund has released Aplomado Falcons in wide-open grassland areas that provide native food and shelter. They are raised in captivity in Boise, Idaho.

When chicks are about a month old, they are flown to the release sites by LightHawk, a volunteer aviation group that donates flights for conservation projects. Fast flights on private aircraft are the best way to ensure that the chicks arrive with little stress and in good overall health, Heinrich said.

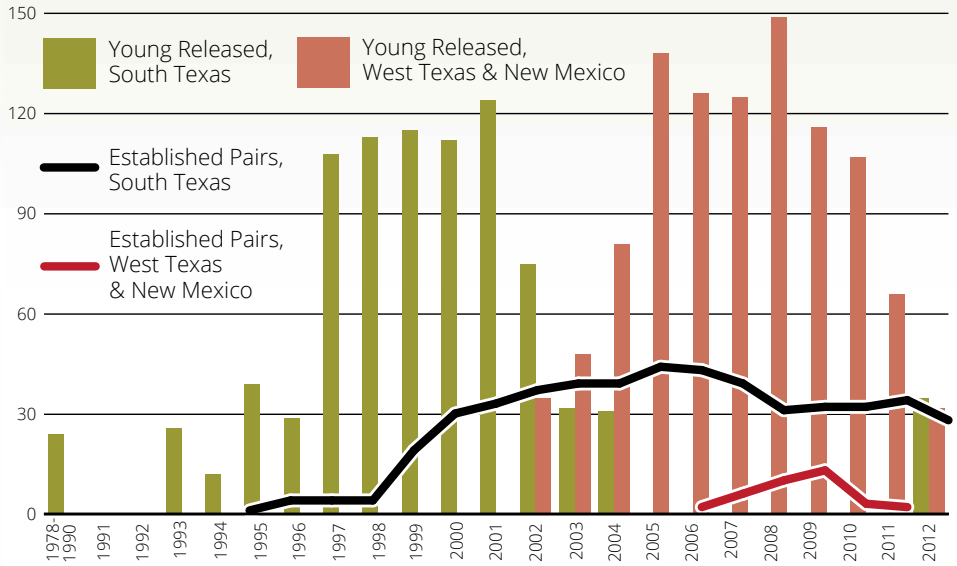
Over the last three years, LightHawk volunteer pilots have transported more than 200 Aplomado Falcon chicks to support the reintroduction effort. This latest flight to Texas was donated by Carl Mattson and Julie Boyd, of Denver, CO, who piloted their Cessna 210 turbo.

When the chicks reached Mustang Island State Park, they were placed at newly constructed "hack sites." Each site consists of a large wooden box atop a platform raised 10-12 feet off the ground for protection from predators. The birds were fed while they became accustomed to their new surroundings. A few days later, the door was opened and the birds were able to fly freely. They were fed and monitored at the hack site for about two months while they honed their flying and hunting skills.

Brian Mutch

Currently about 34 pairs nest in South Texas, spread to the north and south of Mustang Island, including the Aransas National Wildlife Refuge Complex and Laguna Atascosa National Wildlife Refuge.

For the recovery effort, the falcons have been released on both private and public lands. The Peregrine Fund has enrolled more than 2 million acres of private Texas ranchland in the Safe Harbor Program, which was developed with the U.S. Fish and Wildlife Service to reduce landowner concerns over endangered species on their property and to provide access to habitat for the falcon.



Long-term commitment: **over 34 years, 1,898 Aplomado Falcons were released. In South Texas, 28 pairs are established, but recovery in West Texas and New Mexico is hampered by severe drought.**

▼Nest structures

We placed 10 new nest structures: three on San Jose Island, four on Matagorda Island, and three in the Laguna Atascosa area. We also serviced 31 nest structures to ensure they were suitable for use during the nesting season. Most structures required a minimal amount of maintenance. The new structure design has effectively ensured their use only by Aplomado Falcons and provides security from predation.

▼Safe Harbor

Of the known pairs of Aplomado Falcons established in Texas, approximately one-third are located on properties enrolled in our Safe Harbor program. The Safe Harbor permit includes 57 counties in South and West Texas.

▼Monitoring remnant populations in Mexico

Since 1996, we have monitored nest productivity of a small population of Aplomado Falcons in Chihuahua, Mexico. This population has decreased because of drought and the conversion of grasslands to agriculture. Native grasslands, particularly at the Sueco area, continue to be converted to farmland with several territories still threatened by agriculture.

We are working with state and federal agencies and conservation organizations in Mexico and the United States to address this issue. Cooperator Alberto Macias-Duarte located five breeding pairs. If the current trends in grassland conversion and reproductive success continue, the last known desert-dwelling Aplomado Falcon population in Chihuahua will become extinct during this decade.❖

Gulf Oil Spill Monitoring

Project Director: *J. Peter Jenny*

Plummeting numbers of Peregrine Falcons alerted the world to the environmental dangers of DDT in the 1970s. Now, we are using Peregrine Falcons to measure possible long-term effects from the 2010 oil spill in the Gulf of Mexico.

As part of a fragile, complicated food web, the falcons serve as bio-indicators. If toxins are present, they will accumulate in ever-larger quantities as they move through the food chain from the smallest organisms to larger predators, such as Peregrine Falcons.

More than 80 percent of Peregrine Falcons from Alaska, Canada, Greenland, and the northern United States travel through the Gulf region each spring and fall. Our goal, in cooperation with Earthspan, is to evaluate their exposure to toxic polycyclic aromatic hydrocarbons (PAH). We capture them on the Texas Gulf Coast, look for external signs of oil exposure, and collect a blood sample. The birds are fitted with identification bands and released immediately to continue their migration.

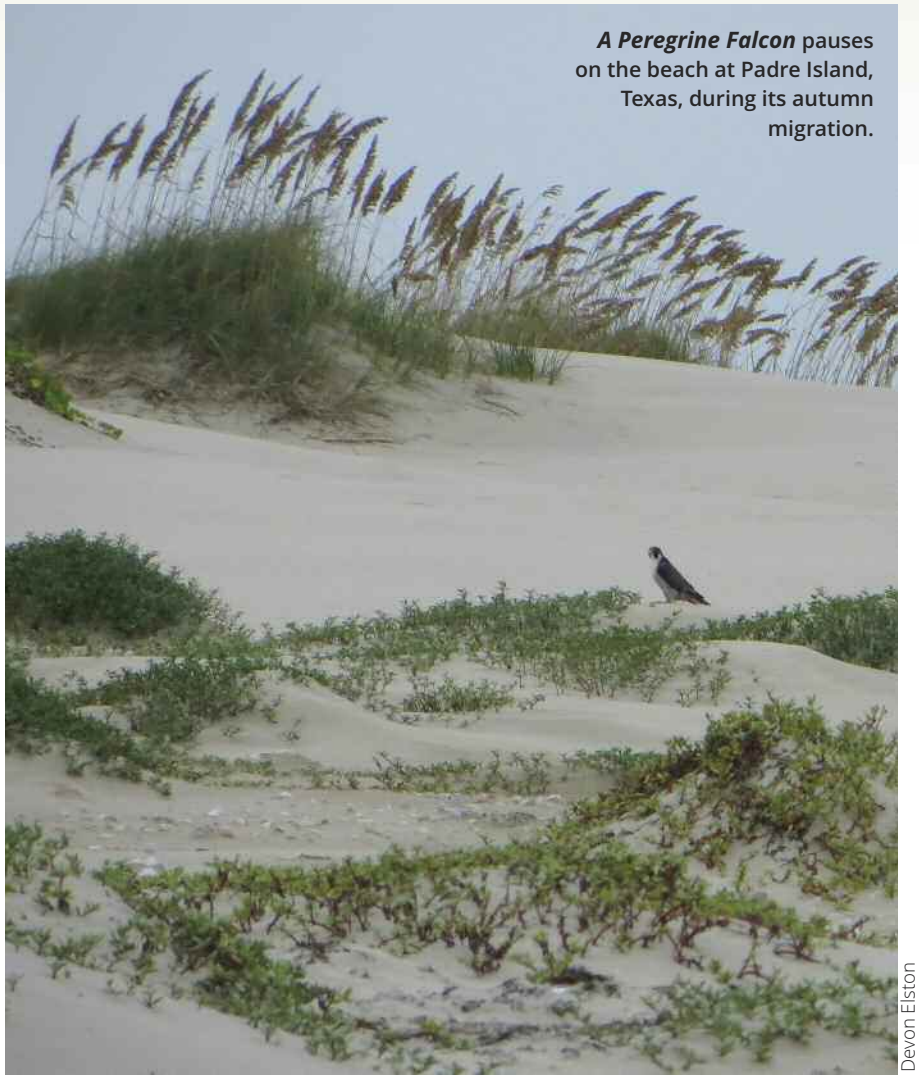
Analyses of the blood samples will be used to evaluate the need for further investigations on summer breeding grounds and further migration sampling.

Results

The Deepwater Horizon Oil Spill released an estimated 5 million barrels of oil into the Gulf of Mexico for four months in 2010. The Peregrine Fund and its partners, Earthspan and the University of Connecticut, collected and analyzed blood samples from migrating Peregrine Falcons at South Padre Island, Texas, and Assateague Island, Maryland, to measure pre- and post-spill concentrations of polycyclic aromatic hydrocarbons (PAH) from 2009-2012.

Current results from this study demonstrate that there was an increased incidence of PAH contamination and in PAH blood concentrations in Peregrine Falcons sampled along the Texas Gulf Coast after the oil spill. This data demonstrates a significant shift in PAH composition.

Through comparisons with similar studies, the source of increased PAH contamination in 2010 and 2011 was likely due to crude oil, which was not present the year prior to the spill. Percent occurrence and blood concentrations of PAH burdens have decreased in 2012. However, blood concentrations remain above pre-oil spill levels and PAH profiles suggest a petrogenic origin, differing from sampling periods prior to the spill.



A Peregrine Falcon **pauses on the beach at Padre Island, Texas, during its autumn migration.**

Devon Elston

These factors warrant the need for continued monitoring of blood PAH concentrations. To our knowledge, this is the first field study in which levels of PAHs were measured nondestructively in Peregrine Falcons with the purpose of monitoring oil pollution in a coastal environment after a large oil spill.

The analysis of PAHs in Peregrine Falcon blood provide a convenient and relatively rapid method, with little disturbance to birds, for monitoring PAH contamination in their avian food chain. Overall, our study demonstrates the use of Peregrine blood as a monitoring tool for oil exposure. ❖

American Kestrel Partnership

Project Director: *Matt Giovanni*

The American Kestrel is colorful, easy to identify, widespread, and has a strong affinity for nestboxes — all of which make it an ideal candidate for a partnership between citizen scientists and professional scientists.

Evidence shows long-term declines of American Kestrel populations in many regions of North America. The causes are unknown, largely because of insufficient data, highlighting the need for producing information and conservation strategies.

In April 2012, we launched the American Kestrel Partnership to coordinate a web-based network of locally managed nestbox monitoring programs that create habitat and generate data for understanding relationships between nesting and environmental factors.

Kestrel enthusiasts have monitored nesting kestrels for more than half of a century, but a network for combining these efforts and data did not exist until now. The American Kestrel Partnership provides a central place for this valuable information and tools for kestrel enthusiasts to communicate and share resources. We are grateful for the generosity of all those who contributed to the successful launch of the Partnership and continue to enthusiastically support its achievements and goals.

Matt Giovanni

Michele L. Mooney

Christine Thody, Spring Creek Prairie Audubon Center

More than 900 nesting boxes **went up across North America in 2012; participants include volunteers in Montana (above) a high school environmental science class in New York (top), and families in Nebraska (right).**

Results

The American Kestrel Partnership exceeded expectations in its pilot year: more than 400 kestrel enthusiasts from across North America and Latin America joined and generated 2,500 nesting observations from 900 kestrel boxes. The Partnership's rapidly growing database is supporting the most extensive study in history for understanding relationships between kestrel nesting and influential environmental factors.

For example, nesting could be influenced by land use, such as the conversion of grasslands to row crops; climate change; environmental contaminants, like rodenticides, lead, mercury, PBDEs, and PCBs; and abundance of predators and cavity competitors, like the Cooper's Hawk and European Starling, respectively. The American Kestrel Partnership is well on its way to elucidating these ecological relationships and applying them to conservation strategies at unprecedented spatial scales.

Citizen science

Achieving our research and conservation goals is largely dependent on engaging and energizing citizens across the Western Hemisphere to build, install, maintain, and monitor kestrel nestboxes. That requires maximizing project exposure and promotion to the public. The Partnership's KestrelCams streamed live video of a nesting pair to thousands of viewers across the globe, generating more than 500,000 webpage views in less than two months, and were featured on the Cornell Lab of Ornithology's Bird Cams website. KestrelCam viewers also generated data while watching the nesting kestrels by logging their observations online, resulting in a database containing more than 3,000 observations of prey deliveries and other behaviors.

As public outreach and participation in the American Kestrel Partnership continue to gain steam, we are continually developing novel tools to maintain dynamic, engaging, and supportive relationships with our many partners. Our website provides many interactive tools

and resources for partners to network with one another and share resources and knowledge.

We helped fund and coordinate establishment of large nestbox programs for the Minnesota, Texas, and Yosemite Audubon chapters with a small grants program. We also developed a Student Gear Grant program that provided high-grade spotting scopes and binoculars to seven students studying American Kestrels at six universities.

▼Research Committee

Engaging and partnering with the kestrel research community is critical for achieving research goals that can inform conservation planning at large spatial scales, including North America and potentially even much of the American Kestrel's full range across the Western Hemisphere. To achieve advanced research of the highest impact, we designed a Research Committee to build collaborative teams and projects with professional scientists. The committee consists of about 60 scientists with active or developing kestrel research programs and several subcommittees focused on pursuing grants for specific areas of research, such as nesting ecology, migration, toxicology, and genetics.

By cooperating and making our kestrel research efforts collective and coordinated, the Research Committee has the potential to take American Kestrel research to unprecedented levels of impact and spatial scale.❖

Two young male kestrels **explore their urban environment in Providence, Rhode Island.**

Webcams mounted in a nest box **give viewers an intimate understanding of nesting behavior.**

NEOTROPICAL RAPTOR CONSERVATION PROGRAM

About one-third of the world's birds of prey are found in the Neotropics, but the landscape is being rapidly altered, making loss of habitat a serious concern. Conservation is an urgent global priority in this large region, which extends from Mexico and the Caribbean to Central America and South America, including the Galapagos and Falklands islands.

Central America and the Caribbean are particularly important because of the limited extent of remaining forest, diversity of species, and large number of migrating birds that winter there.

In the 1980s, we began focusing on the Harpy Eagle, Orange-breasted Falcon, and other birds of prey. Since then, we have added the Ridgway's Hawk and supported student research on a variety of other Neotropical species.

Education is an essential part of our comprehensive approach to conservation in the Neotropics. We work with local communities to build respect and appreciation for birds of prey, and we support university students conducting research on the status of little-known species.

Our time-tested, hands-on, science-based approach has a unique and valuable role for conservation in the Neotropics. Our investments now will strongly influence conservation actions and raptor research for decades to come.

The Ridgway's Hawk **is vulnerable because of its small population size and limited range.**

Thomas Hayes

West Indies Project

Project Director: *Russell Thorstrom*

Our West Indies Project is the only known conservation effort to save threatened birds of prey in the Caribbean region. We currently are focused on the critically endangered Ridgway's Hawk.

Historically, the hawk was found throughout the island of Hispaniola, where the Dominican Republic and Haiti are located, but our research showed that the breeding population occurs only in Los Haitises National Park in eastern Dominican Republic. After thoroughly searching, surveying, and monitoring this population for a decade, we determined that only about 300 individual birds remained, leaving them vulnerable to extinction through catastrophic events such as fire, hurricane, or disease.

To reduce this risk, in 2008 we began an experimental "assisted dispersal" project to learn if breeding pairs could be reestablished in former range outside of the national park. Young birds are collected from nests about one week prior to fledging and transferred to a structure where they are fed, monitored, and released.

We currently are releasing the birds in good habitat on private land owned by Central Romana Corporation, Ltd. and Grupo PuntaCana. We also are working with local communities to reduce chances that the birds will be shot and killed. Though still in its early stage, we are encouraged that assisted dispersal can be successful at preventing extinction of the Ridgway's Hawk.

Thomas Hayes

Young hawks **are relocated about one week prior to fledging.**

Since 2008, a total of 37 young hawks have been released.

Results

We conducted a population survey throughout most of Los Haitises National Park and recorded 26 territorial and 20 nesting pairs. At Los Limones, 49 nesting territories were monitored and 46 pairs produced 67 nestlings (50 were from first nesting attempts and 17 from second nesting attempts) of which 36 fledged successfully, including 10 taken to Punta Cana and Loma la Herradura release sites. Of the 36 fledglings, 33 were banded. At Punta Cana, one of the five young hawks released died from suspected predation and one from electrocution. Also, one bird from the 2011 release was found dead, probably due to human persecution. At Loma la Herradura, one of the five hawks released succumbed to an unknown cause, but predation was suspected.

Our nest management activities included reinforcing seven nests in Hispaniola Royal Palms *(Roystonea hispaniolana)* to prevent them from falling down. We carried out nestling management with 20 young birds infested with the parasitic *Philornis* fly larvae. They were treated with diatomaceous earth, Ivermectin, Sevin dust, and Fipronil, resulting in 17 of the young surviving to fledging. The worst case of *Philornis* infestation observed was in one nestling with 110 larvae removed. Since the first experimental assisted dispersal release in 2008, a total of 37 young hawks have been released: 20 at Loma la Herradura and 17 at Punta Cana.

We conducted an educational campaign to make people aware of the Ridgway's Hawk by visiting 237 people during a door-to-door visit in five communities near the two release sites. We are designing an educational brochure on the Ridgway's Hawk with the Punta Cana Ecological Foundation for handing out to visitors to Punta Cana. We drafted a memorandum of understanding with Fundación Propa-Gas to conduct a national environmental education campaign and assist in community development in Los Limones. A presentation was given to 30 personnel of the Ministry of Environment on the Ridgway's Hawk project and objectives. We began forging a relationship and contacts with the Natural History Museum and Zoo in Santo Domingo.

Developing local capacity through training

In Dominican Republic, we are developing local capacity for raptor conservation by supporting and training biological field assistants from Los Limones. The Hispaniola Ornithological Society has provided biodiversity and conservation training to several park guards and local persons from communities bordering the park, especially in the Los Limones area. They are assisting in monitoring the nesting pairs of Ridgway's Hawks within the park. Samuel Balbuena and several assistants have conducted the assisted dispersal releases of young Ridgway's Hawks to private and protected land holdings owned by Central Romana Ltd., the largest national company in Dominican Republic, and Grupo PuntaCana. ❖

Harpy Eagle Conservation

Project Director: *Hernán Vargas*

In 2000, we began studying the largest known wild population of Harpy Eagles in Central America, located in the Darien Province in Panama, building on field work that began in 1992.

The wild Darien birds are important as a "source population" that could restore eagles to places where people have shot them out of their remaining habitat.

Through this project, we have established a replicable model that involves training local residents, conducting research and environmental education, and building awareness and involvement in communities that must learn to co-exist with Harpy Eagles.

▼Mortality, nest searches, monitoring

No reports of dead or injured wild Harpy Eagles were received in our study site or other areas of the province of Darien. We continued to evaluate our conservation efforts by revising older data from diagnostic interviews and records of Harpy Eagles injured or killed, and we identified that over the years, fewer cases occurred in the Chepigana district (our study area). It is important to continue reinforcing conservation messages and educating local people about conservation values.

We continued to search for Harpy Eagle nests. We found a huge structure in a Cuipo tree but did not see any evidence that it was a Harpy Eagle nest. We have included it in our monitoring schedule. We also found a Crested Eagle nest in a patch of primary forest, but all the forest around is destroyed or is secondary forest. We also tried to confirm a Harpy Eagle nest report in Dos Bocas stream. We did not observe breeding activity, however we presume that this nest exists because the informant knows the species very well.

We made transects around main nests to find alternative nests for two pairs in Ignacea and Chati Streams. We found an alternative nest for the Chati Stream pair and observed a chick about three months old. The nest is located in the border of a primary forest.

We monitored 45 Harpy Eagle nests and assessed the breeding status of 33 known pairs. In the first and second quarters, eight territories were active (five with juveniles, one with incubation, and two with adults present). In the third and fourth quarters, six territories were active, all with juveniles present.

Because the Crested Eagle is another important species to conserve, we established a schedule to monitor the nest close to Cémaco Community. The technicians from this community collected behavior and diet data. A juvenile was observed flying around the nest and being fed by the parents.

▼Habitat description

To identify how the landscape is structured, we compared forest changes through the years at each nest to determine whether a relationship exists between the loss of forest cover and reproductive activity. We are analyzing the forest cover in different periods (1993, 2000, 2006, and 2008) in relation to the locations of nests using Geographic Information Systems. Preliminary analysis showed how the landscape is changing and provided information about the species' tolerance to human pressure in the habitat.

We are working with these characterized maps to analyze the landscape structure close to and around the nest locations to identify possible threats that could affect the breeding productivity where nests are close to disturbed forest or agricultural areas.

▼Movement, dispersal, habitat selection

We stopped radio tracking two Harpy Eagles tagged with leg bands LR and KC. The transmitters of both eagles did not emit signals and ground searches and airplane searches were not successful. Past data obtained from the eagles suggests that they are still alive because they were observed hunting and moving through different types of landscape with no problems. Both individuals show cryptic behavior, which reduces the risks of being injured or killed by humans.

We captured and tagged one adult female Harpy Eagle with both PTT and VHF radio transmitters. This eagle's ID is KZ. She was very evasive and difficult to observe, however she was healthy and seen hunting, flying, and bringing food to her young.

To understand habitat requirements, we captured four wild juveniles between 1.5 and 2 years.

After capture, we monitored the juveniles and did not observe any sign of negative effects of the transmitters on normal behavior. The birds continued to be fed by the parents and fly around the nests without problems.

▼Training

Since starting the project in 2000, we have trained 53 Panamanians in education and research techniques using a participatory strategy to increase the knowledge and empowerment among the local people in conservation issues. We trained seven technicians and three volunteers. Calixto Conampia and Arilio Ismare are being trained in environmental education techniques.

Technicians Arilio Ismare, Calixto Conampia, and Darisnel Carpio participated in the conference "Industrial Resource Extraction and Infrastructure Development in Tropical Forests" organized by The Environmental Leadership and Training Initiative and the Smith-

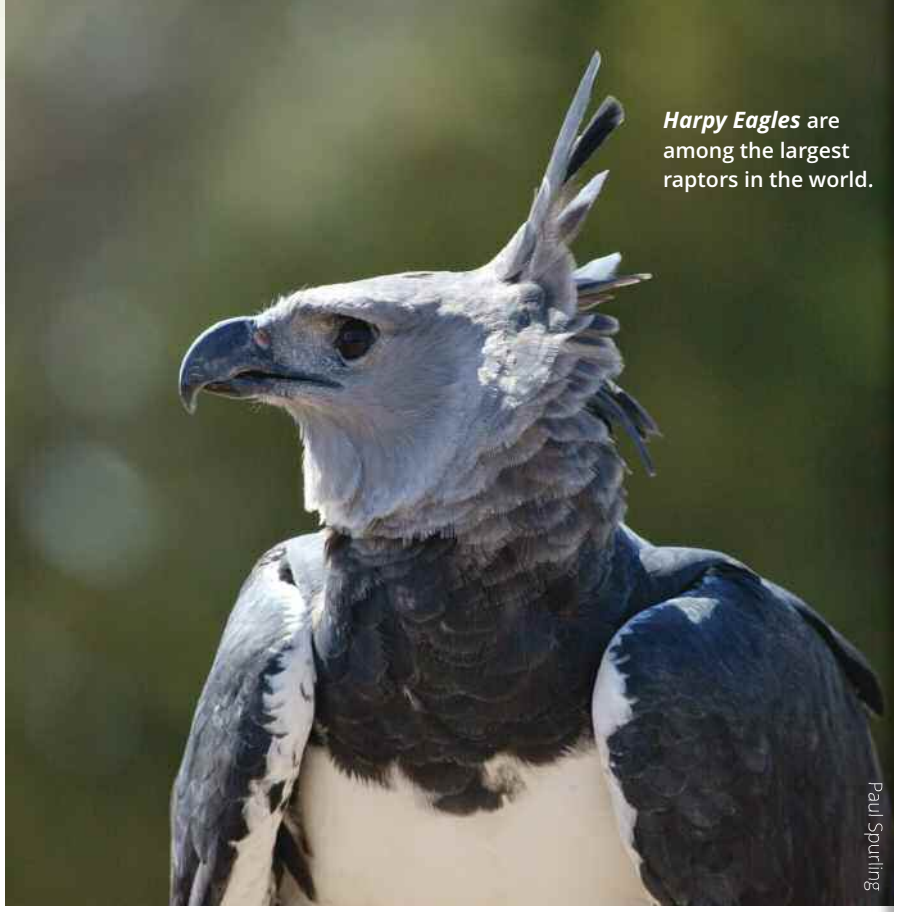
sonian Tropical Research Institute.

We continued to support the formal education of our technicians and volunteers. Two technicians (Calixto Conampia and Rutilio Calderón) finished their high school education, one technician (Arilio Ismare) concluded the first level of high school education, and Darisnel Carpio is in the fourth year of university to get a bachelor's degree in Community Development. Mr. Indalecio Mecheche (technician), and Mr. Indalecio Mecheche, Jr., and Nercio Flaco (volunteers) were also supported in their formal education in the first level of high school education.

▼Environmental education

We participated in two FestiHarpias, providing information to more than 2,500 people. We shared information related to the biology, ecology, and behavior of the Harpy Eagle with children, youth, and adults. We also talked about our progress results in the Research and Conservation Program in Darien. We gave environmental talks and carried out various training education activities for more than 400 people in Chepigana, La India, Llano Bonito, Cémaco, and Quintín communities. The talks were about Harpy Eagles and their threats in Darien and about how conserving the Harpy Eagles benefits local people.

To inform the local environmental authority of Panama about our conservation work, we met and explained how our work is going, the current problems that could affect the persistence of the species, and the needs for local actions to decrease threats such as forest degradation and new land invaders. The same explanations were offered to the Embera and Wounaan traditional authorities in a General Congress. The audience for this activity was more than 300 people.



Harpy Eagles **are among the largest raptors in the world.**

Paul Spurling

It is important to develop more environmental educational games to involve and teach the children and teens about the Harpy Eagle. To this end, we designed two environmental games about the Harpy Eagle and other raptors. One of the games is called "An Adventure in the Harpy Eagle World" (similar to a monopoly game) and "Memory Table" with birds of prey of Panama and the prey of Harpy Eagles. We used both games, and the results were impressive. People enjoyed participating and asked us to share the games and make them available to universities such as the University of Panama.

As a formal way to educate and disseminate project information, technician Darisnel Carpio and the project coordinator J. de J. Vargas González participated in the IX Neotropical Ornithology Congress in Cuzco, Peru.❖

Neotropical Raptor Network

Project Coordinator: ***Marta Curti***

We created the Neotropical Raptor Network at the urging of attendees at the 2002 Neotropical Raptor Conference who wanted to foster better communication and collaboration among the biologists, ornithologists, falconers, raptor enthusiasts, and other conservationists working in Mexico, the Caribbean, Central America, and South America.

▼Results

In conjunction with the 2011 Neotropical Ornithological Conference in Peru, we hosted a raptor symposium on *Micrastur* and *Leucopternis*. Ten individuals supported by The Peregrine Fund participated in the conference and contributed 13 presentations, five of which were given as part of the raptor symposium.

We have begun collaborations with Raptor Research Foundation and the World Working Group on Birds of Prey to organize a joint conference to be held in Argentina in October 2013.

The 12th and 13th editions of the electronic Neotropical Raptor Network Newsletter, *Spizaetus*, were published on the network's website in English, Spanish, and Portuguese and are available as permanent files for members. The membership on the listserver has increased from 347 to 360.

Orange-breasted Falcon Project

Project Director: *Robert Berry*

Two decades of research has confirmed that the northern population of Orange-breasted Falcons in Belize and Guatemala is isolated by ~1,500 km from the little known South American population and is in steep decline, numbering fewer than 40 territorial pairs that occupy less than 4% of their prior range in Central America. The species' specialized habitat requirements, low reproductive rate, and mortality by natural predators, especially the Black Vulture, along with the cumulative effects of habitat alteration, fragmentation, and human conflicts all help to explain the species' high extinction risk.

Beginning in 2007, we began introducing a small number of captive-bred falcons of Panamanian origin into the Belize population to enhance genetic diversity and help mitigate further population declines. Conservation will be achieved by introducing captive-bred birds and by incorporating "safe" nest boxes on natural cliffs that deter predation.

Our knowledge of the species' population dynamics increases through surveys, color banding, and direct observation. Continued research will provide answers to complex challenges faced by this imperiled species such as shooting and lethal parasites encountered in 2012.

Results

Field Report: Belize and Guatemala

We conducted ground surveys at 20 of the 31 known Orange-breasted Falcon territories and 13 were occupied: six in the Mountain Pine Ridge of Belize's Maya Mountains (only half the territories occupied in the 1990s), one in the southern mountains, and six in the Peten of Guatemala. Only two young fledged in Guatemala and none in Belize, the lowest productivity recorded in the small northern population since monitoring began two decades ago.

During banding operations in Belize, two nestlings about 15 days old were found near death, literally being consumed by bot fly larva, the first case seen by the principal investigator since 1993—probably because virtually all cliff climbing and banding ceased after a potentially fatal attack by a swarm of killer bees that inhabit the cliffs. We resumed climbing and banding in 2011 with the protection of a full body bee suit. The distressed chicks were rescued, purged of larva, and imported into our breeding colony because of potentially diminished fitness to survive in the wild.

We discovered a minimal infestation in a second eyrie in Belize that hatched chicks, which we assumed would not be lethal. Subsequent surveys after fledging disclosed the adult falcons but not the juveniles, which are presumed to have perished from the bot fly infestation.

We are unable to quantify the potential mortality from these insects, which we have recorded sporadically since the 1980s. Pending their identification, the fly species may be proliferating along with local livestock as their principal host and pose a larger threat to the falcons similar to an increasing vulture population. We have developed a protocol to purge and innoculate chicks from inevitable future infestations.

We received our first return from a male banded in May of 2011, one of only five juveniles banded. The juvenile was reported shot in December less than five kilometers from its eyrie, the first evidence that intentional human persecution is a factor in the species' decline. Unlike Guatemala, Belize regulates gun ownership, although sophisticated air rifles are not regulated and there are no laws protecting avian species or other wildlife.

We had installed two artificial nest boxes in Tikal Park in 2010 to see if we could attract a second resident pair. The historic pair nested in one of our artificial boxes placed in the exact location where they had nested on Temple II in prior years. The single juvenile disappeared shortly after fledging as the location does not offer the security from abundant avian predators as does the much higher Temple IV.

We placed a vulture-exclusion nest box in a sink hole in Belize after the resident pair suffered two failed nesting attempts on exposed ledges clearly visible to abundant Black Vultures. While our initial thoughts centered on Black Vulture predation, further reflection suggests that aberrant parental behavior may be responsible. Vultures or a mammalian predator such as a rat or Tayra (seen at the eyrie) would almost assuredly have eaten all of the eggs and broken the shells. Coincidentally, a captive pair that laid a very late clutch ate the top and contents of their first egg similar to the eggs in Belize. Our continued efforts to monitor vulture populations at Orange-breasted Falcon eyries may help elucidate the potential role of Black Vultures in nest failures.

We collected egg shell fragments and blood feathers from four eyries in Belize. We submitted DNA from about 35 wild and captive blood samples, feathers, and egg shell fragments for microsatellite DNA analysis to help measure the relatedness between the OBF populations in Belize and Panama and the genetic variability between individual falcons. We are seeking clues from the genome that inbreeding depression may be contributing to the decline in our study population and a solution to fecundity related issues in the captive population such as dysfunctional pair bonding and high embryo mortality seldom seen in captive falcon species.

The hack site

Reintroduction of captive-bred birds is typically employed as a last-ditch effort for a species extirpated from all or a portion of its former range. Our primary restoration efforts are focused on genetic rescue of the small extant population in Belize and Guatemala by adding unique genes from a small but stable and reproductively viable population of falcons in the Darien of Panama.

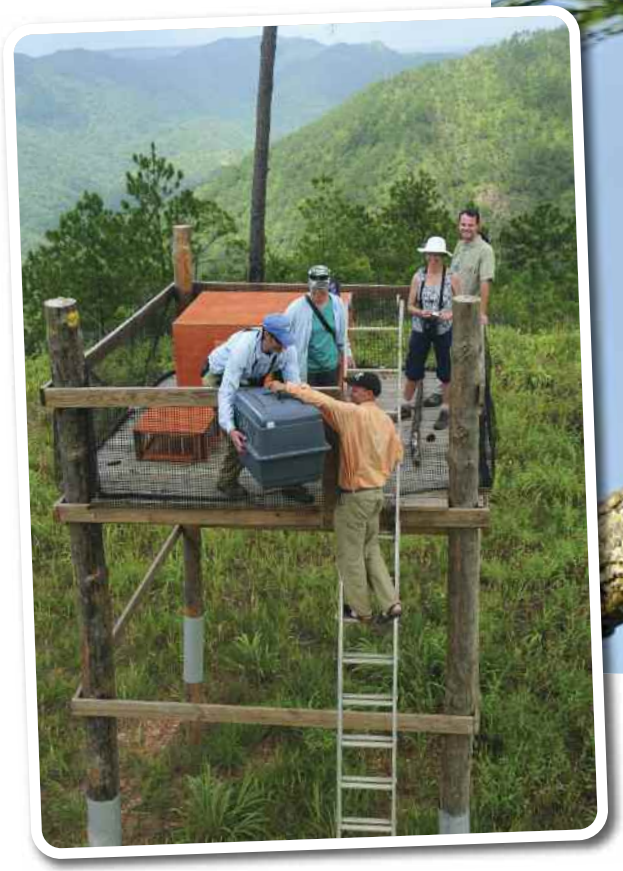
We have released 30 captive-bred Orange-breasted Falcons over the past six years. Twenty-one are thought to have reached independence, at least five were killed by Black-and-white Hawk-Eagles, and four disappeared and are presumed dead. After moving the hack site to "Bob's Point," 15 of 17 juveniles hacked from 2009-12 reached independence and dispersed. The site is located on a high knob on the end of a long narrow peninsular ridge with near-vertical slopes on three sides, providing the advantage of height when pursued by an avian predator.

In 2012, four falcons—one female and three males—were released from a new hack tower (see photo). Soon after fledging they started catching insects and developing their flying skills through play. Their games of chase and keep-away help hone their future hunting prowess and may prepare them for food exchanges during courtship.

Despite their early focus on games with inanimate objects and the pursuit of insects, the fledglings do not attempt

2010 captive-reared "B1" **pair-bonded with wild female "Caya" at the hack site. We are hopeful that conditioning the pair to nest in a tree-mounted nest box will be successful.**

Photos by Robert Berry



Volunteer pilot Jack Long **has flown our juvenile falcons to Belize in his private aircraft on behalf of LightHawk Conservation Flying Service for the past two years. He and his wife Carolyn observe as Brian Mutch, Scott Newbold, and Camille Meyers hoist the precious cargo onto the newly constructed hack site platform.**

Photos by Robert Berry

Looking down at a mated pair of Orange-breasted Falcons at King Vulture Falls, Mountain Pine Ridge, Belize. The male (inset) is captive-bred and color-banded E5.

We collected the first tangible evidence that a captive-bred, tower-released Orange-breasted Falcon can adapt to a natural cliff and bond and mate successfully with a wild partner.

to chase and kill feathered quarry until the height of the fall migration in September and October. The timing is similar at wild eyries where parents continue to feed offspring at least sporadically through late summer or early fall. Our feeding schedule at the hack mimics these strategies by providing food as long as necessary. Feeding was terminated a month later than prior years, possibly the result of sporadic feeding that may have conditioned the three males to an occasional free lunch, as all had been observed with wild kills.

A 2010-released male (B1) adopted the hack site as his territory in 2011 along with a wild adult female we named Caya in 2011, possibly attracted by the hacking juveniles and/or B1. Caya's presence for the past two seasons remains a mystery. We don't like to think that B1 was the only bachelor she could find. Until recently, she has hunted for herself as far as we know. We are navigating uncharted waters in an effort to condition the pair to nest in a tree-mounted artificial nest box at the hack site. We are greatly encouraged that our strategy is working as the pair is now mutually feeding in the nest box and copulating!

We collected the first tangible evidence that a captive-bred, tower-released Orange-breasted Falcon can adapt to a natural cliff and bond and mate successfully with a wild partner. A 2010-released male (E5) was observed courtship-feeding and copulating with a wild female at King Vulture Falls in the Maya Mountains of Belize, one of only a few popular birding destinations with professionally guided tours to see Orange-breasted Falcons and other wildlife (*www.hiddenvalleyinn.com*). The Inn provides critical logistical support for our program in Belize. The pair's behavior confirmed the presence of eggs or small young before the nest mysteriously failed, similar to failed attempts in many prior years. We are cautiously optimistic about this pair, which would represent an important milestone in the restoration process.

▼Captive propagation

The captive breeding colony consists of 27 falcons, equally divided between males and females, including 15 wild founders (11 from Panama and four from Belize) and 12 captive-bred progeny. Forty-five falcons have been raised since 2006, including two visually impaired females that are not included in the breeding colony totals.

Seven individual females laid a total of 33 eggs, 25 in their first clutch. Twelve appeared fertile, all by artificial insemination, but only four hatched. Embryo mortality has plagued prior productivity, but not to this extent, and embryo mortality is not a significant factor in the captive propagation of other falcon species.

Many fecundity-related issues have afflicted the breeding program, which may have genetic implications. Preliminary microsatellite DNA testing suggests an extreme lack of heterozygosity in both the captive and wild populations. Four chicks were produced for release in 2012 and the single second-clutch fledgling was added to the breeding colony.

▼Global status upgraded to "near threatened"

The International Union for the Conservation of Nature revised its global ranking of extinction risk for the Orange-breasted Falcon from the 2008 Red List category of "least concern" to "near threatened," based largely upon The Peregrine Fund's recommendation and 2010 peer-reviewed paper in the journal *Condor*.

Based upon three decades of study, we recommended a regional ranking of "endangered" for Central America, and a category of "data deficient" in South America despite the sparse numbers of records submitted to Cornell's eBird. We are pleased with the IUCN's decision as a higher category of vulnerable or endangered would do little to benefit the survival of the species and likely make our work much more difficult.❖

Outpouring of support rescues chicks from infestation

Two falcons recovered from a near-fatal attack from bot fly larva and are safe in a Peregrine Fund facility, thanks to the herculean efforts of numerous government agencies, veterinary experts, and conservation groups.

Bot flies are parasites that lay their eggs in the skin of animals. The larvae feed on the tissues of the host animal, often with fatal results in young birds.

"We found the dying chicks in a semi-conscious state during routine banding operations in the Maya Mountains of Belize," said Robert B. Berry, Orange-breasted Falcon program director. "Some authorities suggested euthanasia."

Matt Allshouse

Robert Berry

Berry and his team, who regularly monitor Orange-breasted Falcons in Belize and Guatemala, opted to save the rare birds with the help of medical experts in the United States and Belize. After a week of hands-on treatment, the chicks had regained their sight, were eating well, and on their way to recovery.

"Nonetheless, we faced a dilemma, as both the literature and our medical experts opined that the chicks were unlikely to survive if they were released, something we had not considered," said Berry, a lifelong falconer and raptor breeder who raises Orange-breasted Falcons in captivity for release to the wild. "I believed the chicks would be a valuable addition to the captive breeding program and provide long-term data on the impact of bot fly infestation."

The researchers had just two weeks to arrange a complex array of permits for a return flight to The Peregrine Fund's captive-breeding facility in Sheridan, WY, aboard a private aircraft supplied by LightHawk, a volunteer aviation group that donates flights for conservation projects.

"With multiple government agencies in two nations involved, permits seemed impossible," Berry said, "but we were wrong!"

Neotropical Science and Student Education

Project Director: *Hernan Vargas*

The Neotropics, a huge region from Mexico to Argentina including the Caribbean, supports about one-third of the world's species of birds of prey, some of which may be in jeopardy, but about which little is known. In 2005, we began addressing the urgent need for more knowledge of these species with a project to support, encourage, and train Latin American students conducting research on Neotropical birds of prey.

Our goal is to conserve biodiversity and enable people to co-exist with birds of prey. We believe that our investment will pay off in decades to come as communities rely on well-trained and educated local experts and scientific research to find effective ways to conserve birds of prey and their habitat.

▼PERU

Ph.D. student Renzo Piana: *Abundance, ecological segregation, and responses to habitat change across a diurnal raptor community in northwestern Peru (2008 – ongoing)*

Renzo submitted his thesis in December 2012 on the "Ecology and conservation of a diurnal raptor community within a protected area in northwestern Peru." The first chapter, "Diversity, community structure, and niche characteristics within a diurnal raptor assemblage of northwestern Peru" was published in the May issue of *The Condor* (114:279-289).

He developed species distribution models for six diurnal raptor species. Of these, five species only occur in the North West Biosphere Reserve (NWBR) in extreme northwest Peru: Gray-backed Hawk *(Leucopternis occidentalis)*, Short-tailed Hawk *(Buteo brachyurus)*, King Vulture *(Sarcorhamphus papa)*, Great Black Hawk *(Buteogallus urubitinga)*, and Black Hawk-Eagle *(Spizaetus tyrannus)*. A distribution model was also developed for the widely distributed Harris's Hawk *(Parabuteo unicinctus)*.

Average canopy height and percentage of vegetation cover from 5 to 15 m appeared to have an effect on the distribution of Gray-backed Hawk, Great Black Hawk, and King Vulture, while percentage of vegetation cover from 5 to 15 m influenced the distribution of Black Hawk-Eagle and Harris's Hawk. Elevation also influenced the distribution of Harris's Hawk and Great Black Hawk while number of stems influenced that of the Short-tailed Hawk and King Vulture. The only species that seemed to be influenced by cattle density was the Harris's Hawk.

Raptors responded differently to cattle density with the more threatened species (Gray-backed Hawk and Black Hawk-Eagle) negatively affected by increasing values of cattle.

With supervisor Hernan Vargas, Renzo updated the IUCN-Birdlife fact sheet for the Gray-backed Hawk. His study highlights the importance of the Cerros de Amotape National Park, the Tumbes National Reserve, and buffer areas for the conservation of the species globally.

▼ARGENTINA

Ph.D. student Maximiliano Galmes: *Ecology and Conservation of the Crowned Eagle in Central Argentina*

Eleven nests were active during the breeding season between September 2011 and February 2012; six of them were successful and produced fledglings. Of the unsuccessful nests, four nests failed at the incubation stage while in one nest laying did not occur.

Four successful nests from the 2010-11 breeding season were used again in the 2011-12 breeding season suggesting that at least some pairs nest annually.

This year, for the first time, PTTs were attached to five nestlings (average age 50 days) to study habitat use, dispersal movements, home ranges, and causes of mortality post-fledging. PTTs were donated by Microwave Telemetry and the Center for Conservation Biology. One adult female and two juveniles tagged with VHF transmitters were radio tracked.

Six eagles (2 adults, 1 subadult, and 3 juveniles) were found dead due to shooting, electrocution, fires, and drowning. Among these mortalities, one subadult female tagged with VHF and a juvenile tagged with a PTT also were killed.

Images of parental care and feeding frequency of nestlings recorded by video cameras at 13 nests, monitored in 2010 and 2011, were analyzed and are included in a manuscript of parental care in preparation.

Research Biologist Jose Hernan Sarasola: *Conservation Genetics of the Endangered Crowned Eagle*

The objective of this research was to complete the laboratory process of testing microsatellite markers and genotyping eagle's DNA samples. José H. Sarasola and three Ph.D. students (Claudina Solaro, Maximiliano Galmes, and Juan Ignacio Zanón Martinez) traveled to Seville, Spain, to be trained by David Canal (Ph.D. candidate) in the Molecular Ecology lab of the Doñana Biological Station.

DNA samples (114) were collected from wild and captive eagles and also from skins deposited in museums in Argentina, some of them being 100 years old.

Thirty-seven polymorphic microsatellite loci isolated for seven raptor species (order Falconiformes) were chosen for testing amplification in the

Crowned Eagle. Thirteen loci were monomorphic and four showed unspecific amplifications that, despite new attempts to optimize PCR conditions, could not be eliminated. The remaining 18 loci were sequenced to ensure that the homologous microsatellite region was being amplified.

The results of this cross-amplification process provided for the first time molecular markers for the Crowned Eagle that would be useful for future studies on population genetics and conservation of this endangered species. The results of this work were published in issue 4, volume 12 (July 2012) of the *Molecular Ecology Resources Journal*.

▼ECUADOR

M.Sc. student Mari Cruz Jaramillo: *Feeding Ecology of the Galapagos Hawk after goat eradication*

Ecuadorian student Mari Cruz Jaramillo obtained her M.Sc. degree at the University of Missouri, Saint Louis with this study to compare prey items brought to nests following goat eradication to those brought to a comparable number of nests prior to goat eradication. The findings showed:

As vegetation recovered, the hawks did not switch to more arboreal prey as predicted, although there were significant effects of vegetation on prey.

The habitat of the hawks' territory (in coastal, transition, or lava zones) played a significant part in the impact of goat eradication on feeding ecology.

David Anchundia

Rats were a significantly greater proportion of the hawks' diet after goat eradication than before, suggesting an explosion of the rat population as vegetation recovered.

We did not find a significant increase in rat density when measured directly. This may suggest that the hawks are controlling the rat numbers.

M.Sc. student, Jose Luis Rivera: *Survivorship of the Galapagos Hawk after goat eradication*

Although Jose Luis Rivera completed his Master of Science degree in biology in 2010 at the University of Missouri, Saint Louis, the main findings of his research were published in the June 2012 issue of the *Journal of Wildlife Management* 76(6):1197–1204. The main findings were:

Floaters (non-territorial hawks) showed a drastic decline in 2007, 2008, and 2010 attributed to the completion of goat eradication in 2006 and subsequent habitat changes.

Survivorship of territorial hawks declined after the goat eradication but was higher in groups than in pairs, presumably reflecting the benefit of shared defense and offspring provisioning during harsher conditions.

Change in hawk survivorship after goat eradication is an example of unforeseen consequences of an eradication program aimed at ecosystem restoration.

Prof. Patricia Parker: *Ecology, sociality and demography of Galapagos Hawks*

Census, assessments of reproductive activity, and evaluation of group membership of territorial hawks were completed on James Bay and Sullivan Bay study sites, Santiago Island.

Surveys for un-paired adults (floaters) were conducted for 10 days for a total of 80 hours of observation.

Five new hawks were banded, but blood samples were taken from 19 individuals (37 longmires, 36 smears) for genetic and health evaluation.

▼BRAZIL

Ph.D. student Francisco Denes: *Raptor community assessment in the Cerrado and Pantanal biomes, central Brazil*

Francisco Dénes conducted two raptor surveys to compare species richness, abundance, diversity, and distribution of diurnal raptors in the Cerrado and Pantanal biomes, comparing these parameters between the wet and dry seasons.

New species records (Swallow-tailed Kite *Elanoides forficatus*, Grey-headed Kite *Leptodon cayanensis*, Pearl Kite *Gampsonix swainsoni*, Crane Hawk *Geranospiza caerulescens*, and Black-and-White Hawk Eagle *Spizaetus melanoleucus*) increased the total number of raptor species to 26, indicating high species richness in these areas.

Francisco geoprocessed a GIS vegetation/land cover map of the state of Mato Grosso do Sul which will be used to estimate habitat availability from the different vegetation classes in the map and correlate habitat variables with raptor count and occurrence data.

Recorded road-kills totaled 202 individuals of 27 species: 14 birds and 21 mammals, including domestic species and prey species for raptors. Among road-killed raptors, four Black Vultures *Coragyps atratus*, two Turkey Vultures *Cathartes aura*, four Southern Caracaras *Caracara plancus*, and a Burrowing Owl *Athene cunicularia* were counted.

Francisco completed all credits of his Ph.D. program and participated in a course on Distance Sampling methods and Distance Program needed for data analysis. Preliminary data analysis was undertaken fitting linear models and generalized linear models to part of the data to test different analysis methods.

▼COSTA RICA

M.Sc. student Laura Riba-Hernandez: *Owls (Strigiformes) of secondary tropical forest: composition, altitudinal variation, and relation with the forest structure of the South Pacific Slope of Costa Rica*

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Andean Condor Projects


Hernan Vargas

2012 marks an important milestone on Andean Condor research in Latin America. The northern populations in Venezuela, Ecuador, Colombia, and Peru are in jeopardy but the southern populations in Bolivia, Chile, and Argentina are still in good conservation status. However, even in these southern countries, local population extinctions are taking place. This condition requires an understanding of the factors limiting population growth and causes of population declines.

We supported the initiation of projects in Bolivia, Ecuador, and Argentina. In Peru, together with local stakeholders, we assessed the conservation status of the Peruvian population, identified main threats, and set priorities for action to achieve long-term conservation goals. The Peregrine Fund is becoming the umbrella organization leading multinational conservation efforts. Here are some of the results obtained in each of the countries.

▼ECUADOR

Research biologist Hernan Vargas: *Movement ecology and conservation of the Andean Condor*

Developed partnerships with NGOs (Fundacion Jocotoco, Fundacion Galo Plaza Lasso), local Indian communities (Comuna Zuleta, Pintag), and ranchers who own large farms with cattle (food for condors).

Provided scientific advice to the Ministry of Environment through the Andean Condor Working Group for the implementation of the Andean Condor Conservation Strategy.

Located and monitored one nest of Andean Condors on a private ranch (Hacienda Antisanilla). This is only the second documented nest in Ecuador; therefore this finding is significant in the context of a poorly-known and declining population.

Condors were surveyed at three roosting sites of Hacienda Antisanilla, and data showed a maximum of 29 condors. Considering that the total population of condors in Ecuador is estimated at 50 individuals, Antisanilla holds about 50% of the condor population.

Based on the importance of Hacienda Antisanilla for the conservation of condors, the Quito Municipality declared this private ranch as a Condor Sanctuary following a request of the Andean Condor Working Group and a submission of a technical report by Hernan Vargas. This is the first Andean Condor sanctuary in South America.

To capture and tag condors, experimental feeding stations were established at four sites. Condors only visited two feeding stations, where one and three condors were recorded by camera traps. No condors were trapped or tagged. The low numbers of condors in Ecuador contrasts with the high abundance recorded in Bolivia.

▼BOLIVIA

Research biologist Diego Mendez: *Estimating the size and structure of Andean Condor populations in the central and southern Bolivian Andes*

Condors were surveyed in three experimental feeding stations: two in the Cochabamba Department (at 1650 and 2500 masl) and one in the Chuquisaca Department (2100 masl). These locations were in the Inter-Andean Dry Valleys ecoregion.

At the Cochabamba feeding stations, Real and Huanacuni, a maximum of 67 and 61 condors were observed at each station. Most of the condors were adults, particularly males.

No condors were observed at the feeding station located in Chuquisaca.

▼ARGENTINA

Ph.D. student Pablo Alarcon: *Biology and Conservation of the Andean Condor*

Nest searches were carried out for 33 days following five PTT-tagged Andean condors (three females and two males) that showed brood patches at the time of capture. An active nest was located with a chick aged between 2 and 3 months. Nest sites could not be located for the other radio-tracked condors.

As a measure of food availability for condors, livestock distribution and abundance was estimated along two road transects of 150 and 250 km in length and 100 m either side of the road. Pablo estimated 11,000 head of livestock consisting of sheep (85%), cows (12%), and horses (3%). However, interviews of ranchers and managers of the three most important ranches in the area indicated a total of 44,000 head of livestock.

▼PERU

First National Meeting for the Conservation of the Andean Condor in Peru:

The Peregrine Fund was invited by the Frankfurt Zoological Society in Peru to participate as co-organizer of the First National Meeting for the Conservation of the Andean Condor in Cusco, Peru. The meeting achieved the following objectives: 1) sharing knowledge on the current conservation status of the Condor in Peru, 2) identification of threats and solutions, 3) propose actions to design and develop a national strategy for the conservation of the Andean Condor in Peru, and 4) constitute officially an Andean Condor National Working Group in Peru. Hernan Vargas provided technical assistance for the creation of the Andean Condor Working Group in Peru. Victor Escobar (prior grantee from Chile) and Hernan Vargas delivered presentations on the conservation status of the Andean Condor in Chile and Ecuador, respectively.

Participants agreed that the main threat for the Andean Condor in Peru is the capturing of wild condors for the traditional celebration known as yawar fiesta or blood festival. Although capturing condors for this celebration is illegal, 40 municipalities capture about 80 individuals per year, of which 20% mortality is estimated. This mortality rate is predicted to have a significant negative impact on the condor population in Peru whose population is estimated at no more than 500 individuals.

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Costa Rican student Laura Riba-Hernandez graduated with her master of science degree at the University of Sao Paulo in Brazil. She is now writing a paper derived from her thesis research.

Her study provides first data on the distribution, species richness, and composition of owls along an altitudinal gradient ranging from 0 to 1200 masl.

Eight species of owls were recorded: *Magascopous guatemalae, Megascops clarkia, Lophostrix cristata, Pulsatrix perspicillata, Glaucidium costaricanum, Strix virgata, Strix nigrolineata,* and *Aegolius ridgwayi.*

▼CHILE

Ph.D. Student Tomas Ibarra: *Nocturnal raptors in the temperate Forest of Chile*

A full field season was carried out to study the ecology and conservation status of the Rufous-legged Owl *(Strix rufipes)* and Austral Pygmy Owl *(Glaucidium nanum),* and evaluate these species as biodiversity indicators in the threatened temperate rainforests of Chile.

Tomas conducted 556 owl surveys at 95 selected sites on a grid across the temperate Andean forests.

Both owl species were detected from lowland to highland stands across the altitudinal and land-use gradient studied. He collected 149 (26.8%) records for the Rufous-legged Owls and 173 (31.1%) for Austral Pygmy Owls during the breeding season. The number of records for the Rufous-legged Owl is promising since this species has been identified as the raptor with the highest conservation priority in South American temperate forest ecosystems. It is necessary to consider, however, that the Andean temperate forests in the study area are in better conservation condition (in terms of stand complexity and connectivity) than most forests between latitudes 35 and 41 S in Chile.

Project findings were used to prepare a first draft regarding the conservation status of the Rufous-legged Owl for the Chilean Ministry of the Environment (through its ongoing classification process: http://www.mma.gob.cl/clasificacionespecies/).

Tomas published a scientific paper "Rufous-legged owl *(Strix rufipes)* and Austral pygmy owl *(Glaucidium nanum)* stand use in a gradient of disrupted and old growth Andean temperate forests, Chile" in the journal *Studies on Neotropical Fauna and Environment* 47(1): 33-40.

A conference paper was presented at the North American Ornithological Conference (Vancouver, BC, August 2012. http://www.naoc-v2012.com/).

▼PANAMA

Research biologist Jose Vargas: *Harpy Eagle Conservation and Research*

Hernan Vargas supervises this project led by Jose Vargas. The major achievement was the tagging of two juvenile Harpy Eagles with satellite transmitters, the monitoring of 45 Harpy Eagle nests from 33 breeding pairs that produced six fledglings, the scientific and logistical support provided to a group from

Nicole Barko

National Geographic filming a Harpy Eagle nest in Darien, and the dissemination of project results, through various environmental education activities, in Panama City and in the Darien communities (See Harpy Eagle Conservation and Research for further details).

▼PANAMA AND BELIZE

Research biologist Edwin Campbell: *Harpy Eagle Restoration*

Edwin continued the analysis of spatial data and release techniques of young Harpy Eagles released in Panama and Belize. Despite some difficulties in the analysis of spatial data, he finished his master's thesis and published the results on the effect of age at release on the independence of hacked young Harpy Eagles in the 2012 June issue of the *Journal of Raptor Research.*

We found that eagles released at 18-22 months of age (age class 2) showed increased survival and shorter dependence periods than eagles released at 5-7 months of age (age class 1). Between-sex comparisons showed that the average length of the dependence period was longer for males of age class 1 (males 21.8 months vs. females 14.3 months) and for females of age class 2 (females 2.7 months vs. males 0 months).

Hacking proved to be a suitable method for releasing captive-bred Harpy Eagles into the wild, but was more efficient for these large, long-lived, tropical forest eagles when delayed from fledging age, when falconers' traditionally hack falcons, to near the Harpy Eagle's age of independence at 23 months.

▼IX NEOTROPICAL ORNITHOLOGY CONGRESS

Ten people, including students and researchers supported by The Peregrine Fund, participated in the Neotropical Ornithology Congress in Cusco, Peru. The team contributed 13 presentations: 9 oral and 4 posters. Of the oral contributions, five were symposium presentations on *Leucopternis* and *Micrastur.* This symposium was organized by Hernan Vargas and Renzo Piana. ❖

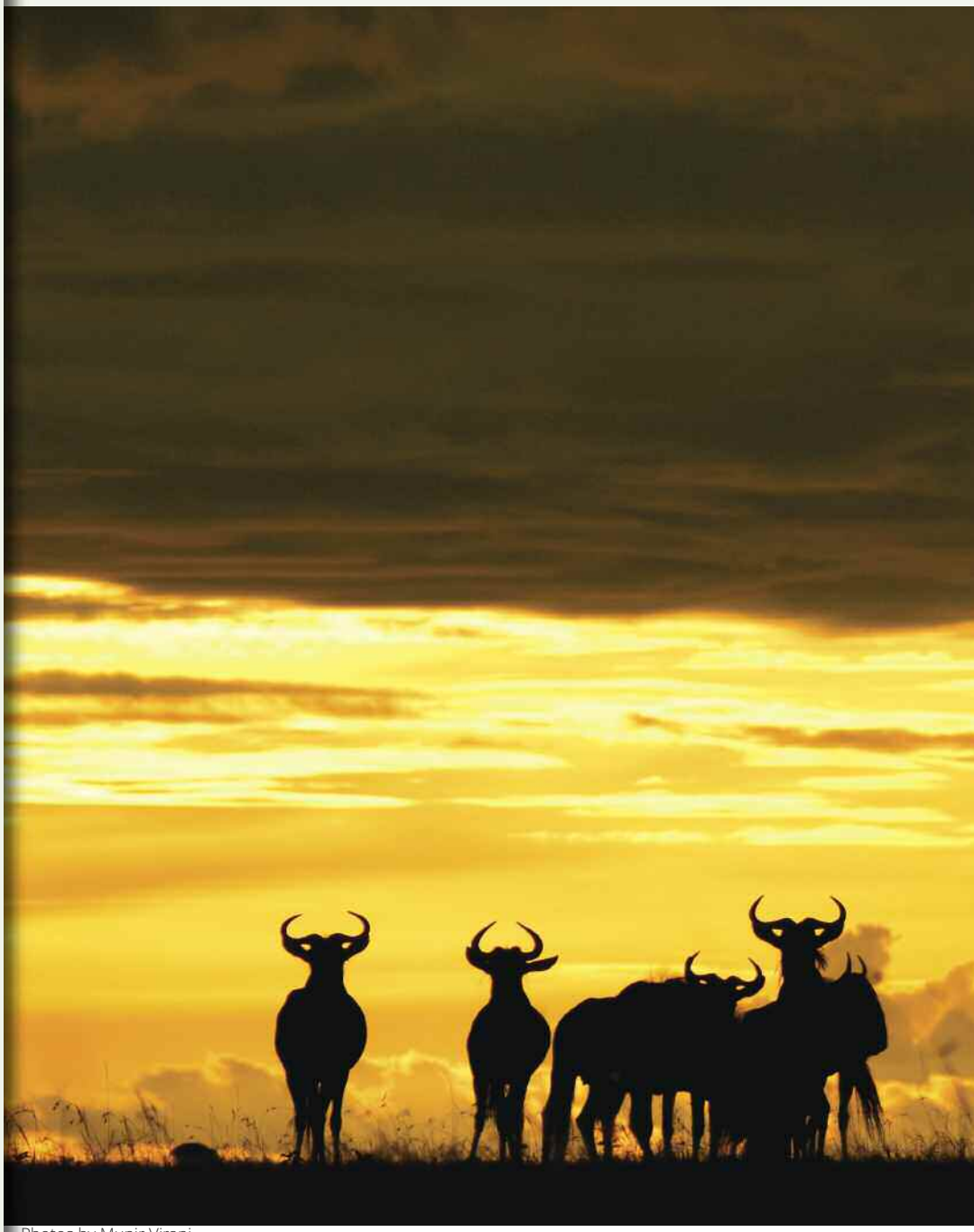
PAN AFRICA RAPTOR CONSERVATION PROGRAM

The African continent and its associated islands contain some of the most important and unique biological resources on our planet. However, the human population has grown from 100 million a century ago to nearly 900 million today and the demand for more land to cultivate has grown, making it increasingly difficult for wildlife, particularly birds of prey, to survive.

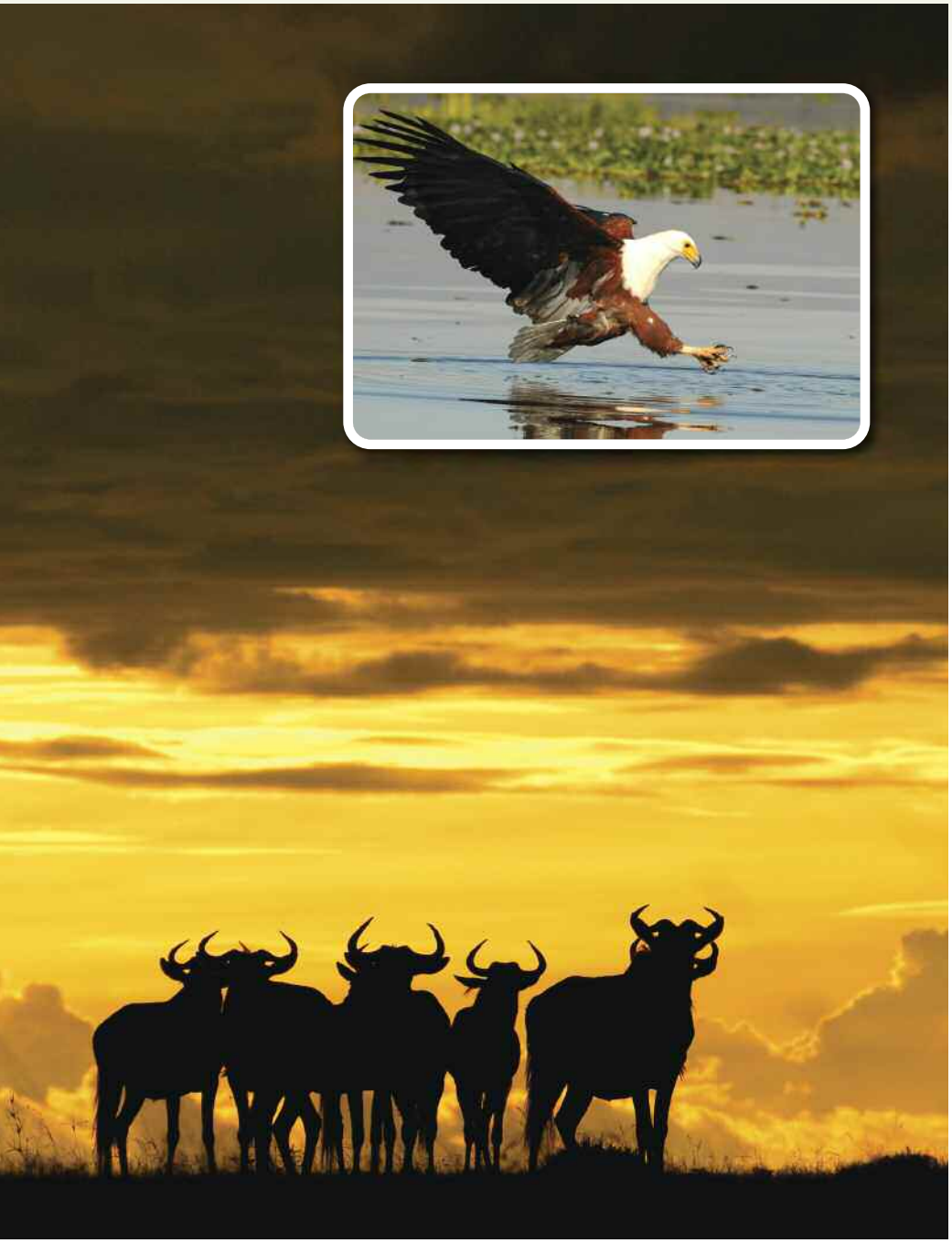
There are 111 diurnal raptor species and 48 nocturnal owl species in this region. Our Pan Africa Project takes an "umbrella" approach to identifying priorities for raptor conservation across the continent. Conserving top predators will help ensure the survival of other species in the delicate food web that are essential for sustaining a healthy ecosystem.

We are achieving our conservation goals by conducting scientifically sound ecological studies on birds of prey, providing hands-on training to students, and working with local communities and the public to help increase their understanding about the need to conserve birds of prey and their habitats.

We teamed with the experienced guides at Tropical Ice **to take six guests on a 10–day Raptor and Wildlife Safari. In addition to walking among elephants, lions, and buffalo, the travelers recorded 545 raptors of 35 species to assist in Project Director Munir Virani's research. Interested in a future safari? Email us at tpf@peregrinefund.org.**



Photos by Munir Virani



East Africa Project

Project Director: *Munir Virani*

Wildlife is threatened by East Africa's fast-growing human population and its impact on the environment. When this project began more than two decades ago, the number and diversity of raptors had declined dramatically due to changing land use and the indiscriminate use of poisons. Future growth in the energy sector from power lines and wind turbines will further add to the problem.

The most threatened group of raptors is vultures, which are killed in large numbers by poisoning intended for large predators like lions and hyenas. When vultures feed on the carcasses of these dead animals, they die, too. Other serious problems in East Africa include pollution, agricultural intensification, and deforestation.

To address these serious and complex issues, we monitor populations of species that can provide an overall picture of the health of an ecosystem. With the aid of our partners — including the graduate students we help support — we monitor raptor populations so that smart strategies can be developed for conserving them.

Student training and public awareness are important components of the East Africa project. Each year, we build local capacity for conservation by training students and field workers. To boost public awareness, we participate in events that highlight and celebrate the important role that vultures and other birds of prey play in the environment.

Our efforts to gather data and seek cooperation from local people and governments will ensure that threatened species on the threshold of collapse will survive for future generations.

▼Results

We continued to build on our existing long-term studies on raptors, specifically on African Fish Eagles in Kenya's Rift Valley lakes, Augur Buzzards, and Sokoke Scops Owls, to understand how these species are affected by environmental and human-caused habitat changes.

At Lake Naivasha, increased rainfall resulted in higher water levels and better quality conditions for fish stocks. The high water levels meant that the regeneration of the papyrus fringe continued to the point where new habitat was created in the form of floating papyrus islands. These islands provided refuge for transient fish eagles attempting to displace territory-holding individuals around the

Government inaction, lack of funding worsen vulture crisis, especially in Africa

Despite their value to humans and the environment, vultures continue to experience serious population declines that are made worse by government inaction and a lack of funding for skilled experts to address the problem, according to a paper to be published in the March issue of the *Annals of the New York Academy of Sciences.*

The peer-reviewed article is co-authored by Darcy Ogada and Munir Virani of The Peregrine Fund and Felicia Keesing of Bard College. It is available online at: http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.2011.06293.x/full

Currently, 61% of vulture species worldwide are threatened with extinction, the authors said. The worst population declines have occurred in South Asia and Africa, where the scavenging birds are unintentionally poisoned, shot for food or sport, and killed for superstitious reasons. Populations of some species have declined by up to 99% in a decade.

They said the vulture crisis highlights the importance of collaboration among scientists, regional governments, financial donors, and media to conserve these ecologically important birds throughout their large range. The authors urged greater support and backing from national governments and local communities, particularly in Africa.

A single poisoned carcass can kill dozens of vultures and other scavengers.

Munir Virani

In Asia, the vulture crisis has received widespread attention, resulting in more stable vulture populations and captive breeding programs. In Africa, however, where the vulture crisis is equally dire, little effort is being made to raise awareness and address the problem, the authors said.

Deliberate poisoning of lions and other large carnivores that occasionally prey on domestic livestock appears to be the biggest culprit in Africa. Vultures die in large numbers after eating the poisoned bait.

"In many African countries, vulture populations remain little known and even less is being done on the ground to ensure their survival," they said. "There has been little government support to conserve vultures, despite mounting evidence of the major threats."

The loss of vultures has potentially significant effects on humans. The scavenging birds perform a vital service by consuming dead animals that would otherwise spread disease and contaminate land and water resources. The article also cites evidence that vultures are important to other scavenging animals that don't have the ability to soar far above the landscape to locate carrion.

"Scavenging of carcasses by vultures promotes the flow of energy through food webs, and vultures have been shown to facilitate African predators, such as lions and hyenas, in locating food sources," the authors said.

lakeshore. We recorded 145 eagles, an increase of nearly 40% since the low 2009 water levels where only 101 eagles were recorded. There was also an increase in the breeding success rate from 26 (74%) active nests out of 35.

We completed our third annual Kenya raptor road survey, which covered 1,760 km. Done in partnership with the Raptor Working Group of Nature Kenya and Kenya Wildlife Service, these surveys are important for monitoring the health of Kenya's raptor populations. Robert Kaai assisted in collecting population data on southern Kenya's largest colony of endangered Rüppell's Vultures at Lake Kwenia. Our efforts at this very important breeding site for Rüppell's Vultures have resulted in the region being classified as an Important Bird Area by BirdLife International.

Shiv Kapila started fieldwork on near-threatened Martial Eagles in the Athi-Kapiti plains, where he is replicating a 1997 study conducted by Carter Ong to assess how Africa's largest eagles are coping with rapid land development and human population increase. Shiv also is documenting Martial Eagle nest site characteristics and diet to evaluate what threats the species face. In collaboration with the Raptor Working Group, we conducted surveys in western Kenya to establish reasons for the decline in numbers of Hooded Vultures.

▼Developing local capacity

Corinne Kendall graduated with a doctorate from Princeton University for her work on vultures of the Masai Mara.

Nicholas Gardener graduated with a master's degree from Exeter University for his work on the habitat use of Long-crested Eagles in Uganda.

Masumi Gudka graduated with a master's degree from the University of Capetown (South Africa) for her study of organochlorine residue contamination in biological and environmental parameters from Lake Naivasha and Lake Baringo.

Kenyan student Seren Waters graduated with a bachelor's degree from Durham University (United Kingdom). His undergraduate dissertation was on documenting the impacts of pastoralism on ecosystem change in Lake Baringo, using the African Fish Eagle as a bio-indicator.

Eric Ole Reson graduated with a Master's Degree from Clemson University (USA) for his study of Maasai attitudes and perceptions toward vultures.

Reson's study was conducted in two group ranches, Siana and Koyiaki. He used a survey instrument involving closed-ended statements, open-ended interview questions, and observation to address his objectives, which included understanding the attitudes and perceptions of the Maasai toward vultures, the importance attributed to vultures, their knowledge of vulture ecology, and their management proposals to address this situation.

Our research on Rüppell's Vultures **resulted in the region near Lake Kwenia being classified as an Important Bird Area by BirdLife International.**

Munir Virani

His results showed that the Maasai favor vulture conservation, however their activities are detrimental to conservation due to poor attitudes toward carnivores, local wildlife authorities, and conservancies in the area. These views result in poisoning, leasing land for wheat farming, and opposing the creation of new conservancies.

▼Increasing public understanding

We helped organize the first Pan African Vulture Summit in the Masai Mara, which was attended by nearly 50 delegates, mainly from eastern and southern African countries. A significant outcome of the meeting was the unanimous adoption of a resolution addressed to African governments to bolster conservation efforts to ensure vulture survival in Africa. We published the proceedings of the summit meeting and Munir Virani was elected Chair of IUCN-Vulture Specialist Group for Africa. Darcy Ogada was elected to the KWS Task Force on birds.

We helped organize our third International Vulture Awareness Day at Ol Pejeta Conservancy in Laikipia County. More than 200 schoolchildren attended the event and performed plays, dances, and poems about vultures and their importance in the environment. A number of guests spoke to the audience about the harmful effects of poisoning wildlife and the need for greater environmental conservation efforts in the region. Awards were given to the winning entries in our vulture-themed art competition.

We gave a series of talks at the Koiyaki Guiding School in Naboisho Conservancy, Masai Mara, and at Mpala Research Centre, Laikipia. Munir presented a six-minute lecture about the importance of vultures at a global TED talent search, which resulted in more than 220,000 views on the TED website. Seven peer-reviewed papers and two popular articles were published. ❖

Madagascar Project

Project Director: ***Russell Thorstrom***

Madagascar is one of the world's highest conservation priorities. This island nation off the east coast of Africa has an amazing diversity of species found nowhere else on Earth. For more than 20 years, we have conducted field research on birds of prey and other species and helped create conservation areas to protect them.

Loss of habitat is one of the most serious challenges facing threatened species. We have addressed this problem by focusing on protecting important wetland and forested areas under the Madagascar Protected Areas System. These relatively unspoiled tracts provide habitat for the critically endangered Madagascar Fish Eagle and many other animals.

One of the sites, Bealanana in the north, protects a unique mosaic of wetlands, marshlands, grasslands, and rainforest. This is where our field crew re-discovered the Madagascar Pochard, a diving duck once thought to be extinct and now classified as critically endangered.

Madagascar Fish Eagles **rely on protected wetland areas.**

Donatien Randrianjafiniasa

A large component of our work in Madagascar is training and educating local people on ways to protect and manage the natural resources that both they and endangered species rely on for survival. We have helped launch sustainable businesses, provided trees for restoring denuded landscapes, organized and equipped crews to fight wildfires, and developed ways to devise and enforce regulations on resource use. Through the years, we also have supported 25 Malagasy students pursuing academic degrees.

Our work in Madagascar is recognized internationally for being hands-on, practical, and effective in conserving a rich source of biodiversity.

These associations...monitor human use and impact on fish stocks, forest, and other resources.

Madagascar Pochards were once thought extinct.

Russell Thorstrom

A male Madagascar Marsh Harrier hunts for prey.

▼Results

We continued the process of creating permanent protection for the three community-based conservation sites (Manambolomaty, Tambohorano, and Bealanana). Tsimembo Forest was added to the Manambolomaty Lakes protected area to increase the amount of dry forest and mangrove habitat included in this 62,745 ha conservation area. We have submitted all pertinent documents to the Malagasy government for approval of this site as a permanent protected area.

We supported the communities in planting seedlings of native trees and oranges for reforestation and mitigation in Tambohorano and Tsimembo Forest. We continued our annual monitoring of Madagascar Fish Eagles breeding in the Antsalova region, which includes the Manambolomaty Lakes complex area, where 28 pairs have been documented.

In the Tambohorano area, we recorded nine pairs of fish eagles. We assisted and supported the planting of tree seedlings of oranges, coconuts, and eucalyptus in the three communities at the Tambohorano site. Mandrozo Lake became an international important Ramsar site in June 2012.

We continue to assist the local associations in writing and preparing management plans and guidelines for the three sites at the regional level and they are waiting for them to be passed to the national level. We have also submitted all documents to the national government to create Bealanana (Bemanevika) and Tambohorano (Mandrozo Lake) community protected areas.

▼Project site results

Manambolomaty—The FIZAMI and FIFAMA associations continued receiving assistance from The Peregrine Fund to manage the Tsimembo-Manambolomaty Lakes Complex. They received 10 fiberglass canoes, 400 fishing nets, 100 beehive boxes, 90 school chairs, 3 wells for potable water, and 1,500 orange trees. These associations, with The Peregrine Fund's support, continue to monitor human use and impact on fish stocks, forest, and other resources. We continued our annual fish eagle productivity monitoring in the Antsalova region with 17 territorial pairs and 11 pairs (32 individuals) at Manambolomaty Lakes Complex.

Tambohorano—We recorded 9 pairs of Madagascar Fish Eagles composed of 17 individuals at Mandrozo Lake. The traditional opening of fishing season (Teabony celebration) took place on 8 April. The local committee for fire prevention continued its activities and fought and controlled eight wildfires. Two annual waterbird surveys were completed with recording of 33 species, up five species from the previous year's count.

Student Stéphanie Razakaratrimo from the University of Antananarivo continued her DEA degree on the nesting ecology of two pairs of Bat Hawks *(Macheiramphus alcinus)*. The local associations monitored and maintained last year's tree plantation and they had 80% success of sapling trees from last year.

Bealanana—The committee for fire prevention continued its fire control and we observed a decrease in the number of fires surrounding the New Protected Area. During the reforestation campaign, 10,000 seeds from three (Tafonomana, Telotritry, and Valotra) native tree species were collected from the forest and transplanted by the local associations. The local association began to collect honey from beehives with training given by The Peregrine Fund.

Each month, a Madagascar Pochard population survey was completed at the four lakes inside the Bemanevika New Protected Area. The pochards were stable at 29 individuals. The captive Madagascar Pochard flock at Antsohihy has grown to 35 adults, of which two females produced several young.

▼Species-specific research

Ph.D. student Julio Carl Ramamonjisoa was analyzing his data and writing his dissertation on Madagascar Red Owls. He has collected more than 450 pellets from 14 roost sites.

Russell Thorstrom

The local technicians continued to monitor the lemur population along the trails established in 2011. We observed markings on tree trunks of the Aye-Aye *(Daubentonia madagascarensis)*, a rare nocturnal lemur, at this site for the first time in this region.

A new pair of Madagascar Serpent Eagles was located. They produced two eggs and two hatchlings but unfortunately both young died prior to fledging. We conducted serpent eagle surveys and recorded five individuals within the Bemanevika New Protected Area.

Development of local capacity

Since 1990, The Peregrine Fund has provided financial support, training, and education to one Doctoral, 20 Master of Science equivalent degrees, and four Bachelor of Science degrees to Malagasy students. These national students have carried out research on a wide variety of topics ranging from plant, fish, and lemur ecology and behavior to bird surveys and species-specific raptor studies. We have helped and supported the formation of seven local associations working with natural resource management and creating the Manambolomaty, Tambohorano, and Bealanana protected areas.

Marius Rakotondratsima

Lily-Arison Rene de Roland **(center) attends a dedication for a community well in Bejea, a village in western Madagascar.**

The Peregrine Fund has a professional staff of Malagasy biologists with degrees at Doctoral (2) and Master of Science (8) levels. Our staff members have received important hands-on training in raptor research and benefited from our annual peer review and program planning process. They have received valuable experiential learning opportunities in NGO management, financial control, and program planning, implementation, evaluation, and proposal writing. ❖

International designation conserves Madagascar Fish Eagle, other wildlife

The Ramsar Convention on Wetlands and the government of Madagascar recently declared the Mandrozo Lake region to have international significance in the effort to preserve the Earth's biodiversity.

"The worldwide recognition is good news for the Madagascar Fish Eagle and other endangered animals," said Russell Thorstrom, director of Madagascar and West Indies projects.

"We have been working in this area for five years and have vigorously sought this recognition," Thorstrom said. "We are delighted and grateful that Ramsar and the government of Madagascar understand how important Mandrozo is for both the wildlife and people that depend on it for survival."

Mandrozo, the fourth largest lake in Madagascar, is about 6 miles inland from the island nation's western coast. On 5 June, Ramsar designated Mandrozo Lake and Kinkony Lake as Wetlands of International Importance, bringing Madagascar's number of Ramsar sites to nine.

"We have completed all the steps necessary for the Malagasy government to declare the larger Tambohorano region, which includes Mandrozo Lake, to be part of the Protected Areas System and are awaiting final approval," Thorstrom said. The Peregrine Fund is working to have two other areas added to the Protected Areas System, the Manambolomaty and Bealanana regions.

Besides the endangered Madagascar Fish Eagle, Mandrozo supports a variety of species, including endangered turtles and threatened reptiles. The lake's fishery is critical to the survival of the fish eagle and to the families whose livelihoods depend on it.

The Peregrine Fund promotes the sustainability of the Mandrozo area by collaborating with local residents and supporting their efforts to manage their own natural resources. It also has introduced alternative agricultural and forestry practices. In the last year, The Peregrine Fund has helped supply equipment to a local fire prevention committee, install informational signs on local resource management, reforest the area with 25,000 trees, and provide fiberglass canoes and efficient fish-drying ovens to stem the rate of deforestation.

"Early on, we wanted to help the Malagasy people help themselves to conserve endangered birds of prey and other wildlife," Thorstrom said.

Madagascar has 24 species of birds of prey; three of them are endangered, including the Madagascar Fish Eagle. Two raptor species had not been seen for more than 60 years until they were rediscovered by The Peregrine Fund. The organization's field work also resulted in the discovery of a diving duck thought to be extinct and two new lemur species.

"Our on-the-ground research continues to fill the void of knowledge on endangered and poorly-known Malagasy birds of prey so that we can devise sound conservation plans," Thorstrom said. "Protecting areas like Mandrozo Lake will ensure that these ecosystems endure for the benefit of wildlife and people well into the future."

ASIA-PACIFIC RAPTOR CONSERVATION PROGRAM

Asia and the Southeast Asian and Australasian islands of the Pacific comprise a huge area rich in raptor diversity. The habitats are diverse, ranging from the world's highest mountains to deserts and tropical rainforests.

More than a third of the world's birds of prey are here, yet many species remain unstudied, lacking even the most basic natural history and information about their status. Conservation efforts focused on birds of prey could have significant results, especially in areas that are little-studied yet suffering significant deforestation, such as New Guinea, Sulawesi, Borneo, and Indonesia.

We know that many birds of prey in this region are critically endangered. In South Asia, the veterinary use of the now-banned drug diclofenac is still a catastrophic problem for vultures, though some populations appear to be stabilizing. In the Philippines, a rapidly growing human population, coupled with deforestation, is threatening survival of the Philippine Eagle.

Research in selected parts of the Asia-Pacific region will significantly enhance our global understanding of the diversity and abundance of birds of prey and lead to sound conservation strategies.

Casper Simon/Shutterstock.com

Philippine Eagle Conservation

Project Director: *Rick Watson*

The Philippine Eagle is one of the largest eagles in the world. This spectacular bird is a global symbol of rainforest conservation.

We participate in the conservation of the Philippine Eagle and its habitat by supporting and assisting the Philippine Eagle Foundation, the primary global entity that works to conserve the eagle and other birds of prey in the Philippines. The focus is on hands-on management, captive breeding and release, field research and monitoring, public conservation education, and community-based initiatives to conserve and restore habitat.

Loss of habitat is a threat to the eagle's survival. Shooting and other forms of human persecution also make the recovery effort difficult. Despite these challenges, captive-bred eagles have begun to establish nesting territories in remaining fragments of rainforest. The Philippine Eagle Foundation also has successfully re-released rehabilitated birds that had been shot or injured.

Campaigns and outreach using new education techniques reach hundreds of people each year in schools and villages close to threatened nesting sites. In this nation of islands, people must co-exist with the Philippine Eagle if it is to survive in the future.

Results

Our goal for this project was to make measurable progress toward conserving the critically endangered Philippine Eagles on the island of Mindanao, Philippines. To accomplish this goal, the Philippine Eagle Foundation focused on the following programs:

- Public education and community-based conservation initiatives
- Research
- Experimental releases of eagles in the wild

Public education and community-based conservation

As immediate stewards of the Philippine Eagles and its forest habitat, people in upland communities are vital to the success of conservation. The Philippine Eagle Foundation has intensified programs on education and community-based initiatives to train and develop partners in upland communities.

A new set of education modules was developed for campaigns in schools and communities near eagle nesting sites. To test one of the three modules, the foundation facilitated a "bird-watching" workshop with 60 grade-school pupils. With the support of the local government and improved education modules, campaigns were then conducted in nine schools.

Prior to the campaigns, the pupils were given a pre-test to evaluate their existing familiarity with the Philippine Eagle, the forest, and the importance of conservation. They received lessons on the biology and behavior of the Philippine Eagle, the importance of the forest, water cycles, and global warming. Lessons concluded with educational games, films, and discussions about what the children can do to help save the Philippine Eagle and forest.

As part of the pre-campaign strategies, the foundation also conducted perception interviews with adult members of the same communities. After the interviews, foundation members undertook standard community campaigns. Pre-campaign interviews provide benchmarks for assessing changes in knowledge and perception after a six-month period to know whether the campaigns resulted in desired conservation outcomes.

The Philippine Eagle Foundation further engaged the communities in eagle nest monitoring through the Adopt-A-Nest Program, which rewards local nest finders with cash. All the eagle pairs monitored since 2010 in the nesting territories nearest to these communities have bred successfully, with all young fledging. Several communities benefited from the nest reward program.

To facilitate integrated development

Giovanne Tampos

Students play the "Eagle Goes Hunting" game **at their school in the mountains of Mt Kitanglad, Bukidnon, Philippines. Teammates take turns wearing an eagle costume and delivering a photo of a prey item to compete for prizes.**

within the indigenous land in southeastern Mindanao, the Philippine Eagle Foundation encouraged the Indigenous People's Organization in these areas to develop a Community Development Plan, which included a natural resource management program to restore forests and monitor eagles and forests.

The Community Development Plan of the Panguandig Lumadnong Panaghiusa includes:

- Rehabiliting 20 ha of grasslands close to the nest site. The organization has reforested 16 ha of grassland and is working on another 20 ha. The community nursery was successfully reactivated and now holds 50,000 indigenous seedlings. The group also accessed the National Greening Program implemented by the Department of Environment and Natural Resources for another 50 ha for reforestation.
- Declaring and managing the nesting territory as an International "Indigenous Protected Area" through the IUCN Indigenous and Community Conservation Area Registry. The registry initiative was successfully presented and digitized mapping has begun.
- Crafting a detailed management plan for the Mahuson Indigenous Protected Area. Through a series of community workshops, the Philippine Eagle Foundation is facilitating the crafting of a detailed management plan for Mt. Mahuson Indigenous Protected Area.
- Training and engaging of indigenous forest guards.
- Supporting livelihood support. Participating households were enrolled in Farmer Field School, a program that increases technical capacity of farmers in sustainable agriculture techniques.

The Community Development Plan of the Sinaka Eagle Bagtok Napunangan Kayupaton includes:

- Rehabilitating 20 ha of grasslands close to the nest site. The organization reforested 37 ha of grasslands and planned to rehabilitate 70 ha of grasslands along forest edges and riparian strips on Mt. Sinaka. Another 50 ha are committed to the National Greening Program. The Department of Environment and Natural Resources surveyed the sites to fund seedling nurseries.
- Crafting a detailed management plan for the Sinaka Protected Area. Efforts were focused on crafting a framework to underpin all initiatives, including the protection of Mt. Sinaka.
- Training and engaging indigenous forest guards.

▼Research

Although research on the population status and behavior of wild Philippine Eagles began years ago, many questions remain unanswered. One important question pertains to how young eagles use patchy forest habitats for survival.

Based on previous studies, adult eagles appear to be breeding fairly well. Despite this, their population is still con-

sidered declining because of high mortality, often by persecution of young eagles. The Philippine Eagle Foundation is using telemetry to address the pressing need to know the fate of young eagles in the wild.

Eagles were trapped at four sites in Mindanao. A wild Philippine Eagle was tagged with radio and satellite transmitters. Named Sumilao, the eagle was one of the three sub-adult free-living eagles often gathering with released Chick 23. This rare and enchanting assembly of Philippine Eagles challenged the Philippine Eagle Foundation to trap the other two wild eagles. Though not successful, such rare experience of trapping an eagle in the sight of others taught important lessons.

Sumilao's movements showed a variety of habitat use. The eagle spent considerable time within forest interiors but also explored forest edges. She remained for a time within the forests along Kulaman River with Chick 23 and the other two untagged wild eagles. This gathering provided substantial data about the social behavior of sub-adult eagles. The interactions of Sumilao with one of the untagged eagles resembled courtship displays seen in paired adults.

Sumilao also showed movements within an occupied nesting territory on the other side of Mt Kitanglad, implying that she may have come from the eagle pair in this territory. Unfortunately, after almost a year of moving around, Sumilao was shot in the pelvis and died. The details of her death are still being investigated. This event is yet another testament to the threats of persecution and hunting, the dominant cause of eagle deaths.

A young eagle also was rescued on Mt Kimangkil in Bukidnon. The eagle was allegedly found by its captor in the forest and held until it was rescued. The eagle is being rehabilitated at the Philippine Eagle Center and will be released.

Eagle Raquel, another rehabilitated bird freed in May 2011 at the Northern Sierra Madre in Luzon Island, dispersed gradually and flew about 48 km southeast of its release site. Unlike Mindanao eagles that used forest fringes, Raquel stayed within forest interiors. Her constant movement indicated that she had not found a territory. The Philippine Eagle Foundation education team will join an observation group to conduct education and outreach in nearby communities.

▼Eagle test releases

A direct strategy to increase the population of endangered Philippine Eagles in the wild is the release of captive-bred and rehabilitated individuals in forests where they have been long gone. Since 2004, we have released seven eagles tagged with transmitters into the wild. One of those eagles is Chick 23, which was released in 2011.

The movements of Chick 23 were confined to the forest along the Kulaman River. His flight and hunting skills improved and our team documented the first-ever prey item: a large Philippine Cobra that Chick 23 caught in the wild. The eagle also was observed feeding on a civet cat. His interactions with wild eagles may have taught Chick 23 to become more aggressive and agile in defense of his space and food. He appeared relaxed in the presence of the other wild eagles and even flew with one of them.

This event is yet another testament to the threats of persecution and hunting, the dominant cause of eagle deaths.

Chick 23 is close to independence but still occupies riparian forests close to settlements. The Philippine Eagle Foundation has informed the settlers close to his activity area and asked for help with monitoring the bird.

Field observations were gathered with help from the Kitanglad Guard Volunteers, indigenous co-researchers who were initially trained with eagle monitoring and management techniques. A workshop was organized for these volunteers with lectures and field exercises. The cooperation of local stakeholders also has been instrumental to the success of the release program.

▼Conservation breeding

Recent captive breeding focused on enhancing productivity of eight eagle pairs through diet and cage enrichment after all of the five eggs laid were infertile. Cameras are being used in six breeding chambers to optimize monitoring of eagle responses to the modified regimens. Two eagles are being imprinted to their caretakers for breeding through artificial insemination. The Philippine Eagle Foundation hatched the first captive-bred Pinsker's Hawk Eagle, the country's second most endangered raptor.

▼Eagle conservation project in Cordillera region, Luzon

In collaboration with San Roque Power Corporation, Department of Environment and Natural Resources, National Power Corporation–San Roque Watershed Area Team, and local government units, the Philippine Eagle Foundation facilitated a conservation and research program for Philippine Eagles in San Roque Watershed, Cordillera and Caraballo Mountains in central and northwestern Luzon. Begun in 2011, the three components continued through 2012: perception studies, conservation education, and Philippine Eagle population surveys. ❖

A critically endangered Long-billed Vulture sits on a cenotaph in the town of Orchha.

Munir Virani

Asian Vulture Crisis

Project Director: *Munir Virani*

Once considered the most abundant large birds of prey in the world, three species of vultures on the Indian subcontinent have been reduced to less than 1% of their population over the last two decades.

We discovered the cause of the massive die-off when our research turned up the culprit: a then-new veterinary drug, diclofenac. Vultures that consumed the carcasses of livestock treated with the anti-inflammatory drug before they died were being poisoned and, within days, dying of renal failure.

Thanks to our discovery, the governments of India, Pakistan, Nepal, and Bangladesh banned the veterinary use of diclofenac and encouraged the use of safer alternatives. Though the continued use of diclofenac is still tragically evident, our surveys are beginning to show a gradual improvement in vulture numbers since the ban took effect.

For millennia, vultures have played a critical ecological and cultural role among the diverse people of the Indian subcontinent by sanitizing the landscape of one of the most livestock-populated regions in the world. Without vultures, people will experience more disease and death as dogs and other scavengers more likely to come into contact with people fill the void left by vultures.

We will continue to monitor, research, and analyze the problem as part of the international effort to restore these vital species of critically endangered vultures.

▼Results

Based on results that show stable trends over the last four field seasons, breeding surveys of Long-billed Vultures in India were not conducted but will continue in FY13 to evaluate our conservation efforts.

In southeastern Pakistan, Jamshed Chaudhry continued to collect data on populations and nest occupancy of Long-billed Vultures in Nagar Parkar district. By comparing annual population trends before and after the veterinary use of diclofenac was banned, our data and models have unequivocally shown that vulture abundance, nest occupancy, and nest productivity are improving. These measures declined by 61%, 73%, and 95%, respectively, in the three years before the diclofenac ban, then increased one to two years after the ban by 55%, 52%, and 95% and continue to remain stable. Stable trends in numbers of occupied nests of Oriental White-backed Vultures have been recorded in the same area at 30-36 nests

over the last three breeding seasons.

In Nepal, a grant was provided to Krishna Bhusal to build on his surveys of occupied nests of Oriental White-backed Vultures and Himalayan Vultures in Arghakhanchi District. Over the three-year breeding period (2010-12), Krishna's data has shown that numbers of occupied nests of Oriental White-backed Vultures fluctuated between 15 and 21 nests, while those of Himalayan Vultures showed a gradual increase from 28 to 36 occupied nests.

At Koshi Tappu National Reserve in Nepal, we funded Hem Sagar Baral and his team, which has recorded 42 and 40 occupied Oriental White-backed Vulture nests over the last two breeding seasons, respectively. This is a substantial increase since mid-2000 when only two nests were recorded.

Although our results are encouraging, we still remain cautious about interpreting them. Continued systematic long-term data collection is needed for this slow-reproducing and long-lived species to accurately measure population trends and determine the effectiveness of the diclofenac ban.

Our paper entitled "Populations of the critically endangered Long-billed Vulture in Pakistan increase following the ban on diclofenac in south Asia" was published in the scientific journal *Bird Conservation International*. Munir Virani delivered a TED Talent Search lecture that highlighted the Asian Vulture crisis and received more than 220,000 views and 147 comments on the TED website.❖

Ban on toxic veterinary drug diclofenac is effective in addressing Asian vulture crisis

The number of critically endangered Long-billed Vultures in Pakistan is beginning to recover, thanks to a ban on the use of diclofenac, a veterinary drug that is toxic to vultures, according to a new study by The Peregrine Fund.

The article, "First evidence that populations of the critically endangered Long-billed Vulture *Gyps indicus* in Pakistan have increased following the ban of the toxic veterinary drug diclofenac in south Asia," was written by M. Jamshed I. Chaudry, Darcy L. Ogada, Riffat N. Malike, Munir Z. Virani, and Matthew D. Giovanni. It was published in the peer-reviewed journal *Bird Conservation International* and is available online at: http://journals.cambridge.org/bci/Virani

Before the 2006 ban, vulture populations in Pakistan, India, and Nepal had dropped by up to 99%. Diclofenac, then a new drug in the veterinary market, was widely used to treat ailing cattle and other livestock, but vultures began dying by the thousands. The birds suffered renal failure after ingesting diclofenac-treated carcasses that had been left in the fields for scavengers.


A Lappet-faced Vulture joins other birds at a carcass.

Munir Virani

By 2008, two years after the ban, breeding populations of the Long-billed Vulture at the study sites in Pakistan had increased by up to 52%, the study shows.

The Peregrine Fund discovered in 2003 that diclofenac was responsible for the catastrophic collapse of vulture populations throughout South Asia. The drug was banned for veterinary use in 2006 by India, Pakistan, and Nepal and in 2010 by Bangladesh.

Recent surveys in India indicate that the ban on veterinary use of diclofenac has markedly reduced its levels in livestock carcasses to almost half of what they were prior to and immediately after the ban, but levels remain sufficiently high to continue to be a problem for vultures, the study said.

"Despite this encouraging trend, we have a long way to go to fully recover vulture populations throughout South Asia," said author Virani, who heads up vulture studies for The Peregrine Fund. "Unfortunately, some livestock owners are illegally using the human version of diclofenac to relieve pain and inflammation in their animals, even when alternatives that are less toxic to vultures are available."

Vultures are social animals, so just one contaminated carcass can poison many birds, he said.

The Long-billed Vulture breeding colony studied for this project is located on cliffs in the Karunjhar Hills in Sindh Province on the extreme southeastern border of Pakistan. For up to two weeks in November and March, researchers counted the number of birds in each age class, occupied nests, unoccupied nests, nestlings, and fledglings.

Results showed that sharp declines between the 2003-04 breeding season and the 2006-07 breeding season began to reverse in the 2007-08 season and have held steady since.

"We are observing similar increases in nest occupancy for White-rumped Vultures in Nepal and Long-billed Vultures in central India, but we need more time to confirm the trends with higher certainty," the authors said. "The population of Long-billed Vultures in Pakistan may grow to the pre-diclofenac size if adult mortality remains low, nesting continues to generate population recruits, and food availability is sufficient."

Before the 2006 ban, vulture populations in Pakistan, India, and Nepal had dropped by up to 99%.

Conservation Science

The Peregine Fund is committed to sharing information quickly and affordably and being an authoritative source of information to researchers, students, policy-makers, and the public.

Please know that you are really helping to make a difference in raptor and owl conservation.

—Global Owl Project

GRIN is fantastic; you have assembled an extremely valuable database; super!!

—Dr. Michael Wink
Germany

Bingo!!! I should have thought of Peregrine Fund earlier—would have saved me a few sleepless nights.

—Tom Schulenberg
Cornell Lab of Ornithology

I indeed do not have access to most journals (our university library here in Swaziland does not subscribe to a single ornithological title, let alone any dealing specifically with raptors)!

—Ara Monadjem
Swaziland

Thank you very much for this! I need them and it was impossible for me to find them elsewhere… Thanks!!

—Soledad Diaz
Argentina

Global Raptor Information Network

Project Director: *Travis Rosenberry*

Since the public launch in 2004, the Global Raptor Information Network has become the most authoritative and detail-rich information portal on diurnal raptors in the world. The website provides up-to-date information on birds of prey and gives researchers access to primary literature with extended species accounts and a large searchable bibliography.

The network receives enthusiastic support from raptor researchers around the world. It is a well-established part of the infrastructure for global raptor conservation and research.

▼Results

The international stature of GRIN continued to grow and activity on the website increased greatly. Efforts of the coordinator were focused mainly on the merger of the U.S. Geological Survey Raptor Information System (RIS) electronic records into the GRIN bibliography and keeping pace with new literature on raptors. Little attention was paid to enhancing the photo galleries, adding to the species accounts, or updating the bulletin board sections, but these tasks will be brought under control as soon as the RIS material is fully integrated.

About half of the GRIN species accounts, especially those for poorly-studied tropical species, are the most thorough treatments available online or, in many cases, in any medium. Individual species accounts and the bibliography are increasingly cited in journal papers. The latter source is the starting point for many researchers embarking on a new study. There are now photographs accompanying 266 of the species accounts and additional photo galleries for more than 100 species.

GRIN has become the most authoritative and detail-rich information portal on diurnal raptors on the worldwide web.

The GRIN bibliography was extended to 53,516 records. Many errors and inadequate keyword strings have been corrected and edited, and the database is now relatively free of errors.

Lloyd Kiff, the former director of GRIN, attended the large 5th North American Ornithological Conference at

the University of British Columbia in Vancouver, where GRIN was mentioned favorably by numerous conference participants.

The website now has 421 raptor researchers, representing 80 countries, with profile pages. Links to more than 1,000 raptor organizations, raptor databases, hawkwatch sites, technical journals, and species-specific websites were expanded and maintained. Reciprocal links were maintained on numerous prominent organizational websites.

According to our statistics monitoring system, the website received 152,627 visits and 1,127,979 hits, representing 29% and 8% increases, respectively, over the previous year. The website ranked seventh on Google for searches on the term "GRIN" in September 2012; prior to FY09, it had not come up in the top 100.

Several thousand pdfs were added to researcher profile pages and the bibliography, and this continued to attract new participants and visitors, partly because it raised our ranking in Google searches. Theoretically, this feature could make it possible to make all of the publications of living raptor researchers available on the GRIN website.

GRIN has become the most authoritative and detail-rich information portal on diurnal raptors on the worldwide web. It continues to receive enthusiastic support from raptor researchers around the world, and it is now a well-established part of the global infrastructure for raptor conservation and research. ❖

Research Library

Project Director: *Travis Rosenberry*

Our Research Library, established in 1994, has grown to be one of the largest collections of scientific literature on birds in the world. Prominent ornithologists and their heirs have donated more than 50 major private libraries of books, journals, and reprints.

Our ever-growing collections include more than 24,000 books and reports, 18,000 reprints, full or partial runs of 1,500 journal titles, numerous newsletters and conservation magazines, as well as other forms of media. The emphasis is strongly ornithological, although there are also many titles on other taxa, conservation biology, and ecology.

The library serves two main functions:

- Preserve the original paper copies of as many bird publications as possible, serving as an essential archive for the global scholarly community.
- Make our material accessible to all, especially researchers and students, by providing pdf copies of any article or book chapter in our collection via email at no charge. To date, we have received nearly 3,000 requests from 73 nations and nearly every state in the United States and province in Canada, for a total of about 10,000 individual pdfs.

Our ability to quickly supply reliable information is especially appreciated when researchers are located in remote areas or where academic resources are scarce. The internet allows us to contribute to scientific research on birds of prey anywhere in the world.

▼Results

We acquired new books and journals through purchases, exchanges, and donations, including contributions from 25 individual donors, eight organizations and agencies, and 20 institutional libraries. The total approximate market value was $47,580.

Non-avian reprints were culled from the reprints collection to better focus on our mission and to make space for the thousands of new reprints we received.

Computerized inventories of the journal collection, duplicate journals, and duplicate books for sale or exchange were regularly updated, corrected, and improved. Sales items were divided into four separate lists, and a new online portal to the lists was created on the Peregrine Fund website to attract buyers.

The library catalogues and inventories of journals, magazines, and newsletter collections were maintained on The Peregrine Fund website and consulted by many online users.

The Peregrine Fund Research Library was selected as the depository for voucher copies of unpublished manuscripts and reports cited in articles in the leading journal, *The Condor.*

▼By the numbers:

- The catalogue included 24,205 records.
- There were 1,348 books and reports added to the library collection.
- The reprints collection contained 16,684 documents.
- PDF copies of 1,012 articles from the library and reprint collections were sent in response to 377 requests from researchers and students.
- We sold $3,584 worth of duplicate books and journals to individuals.
- More than $2,000 worth of duplicate books and journals were exchanged with commercial booksellers for new books.
- We received 177 technical journals, 35 conservation magazines, and 93 newsletters by subscription or exchange. ❖

Book chapter details Peregrine Fund discovery

Three years of painstaking research and field work in Pakistan paid off for Peregrine Fund researchers in 2003 when they proved that a veterinary drug called diclofenac was the cause of a massive and catastrophic die-off of vultures in Asia.

Peregrine Fund Vice President Rick Watson and Washington State University veterinarian Lindsay Oaks tell the story of this landmark discovery in a new book, "Wildlife Ecotoxicology: Forensic Approaches," published by Springer. The chapter they co-authored is one of several in the book that provide case-by-case examinations of how toxic chemical effects on wildlife have resulted in new policies and regulations aimed at improving the environment.

Watson's and Oaks' detailed narrative takes readers on an environmental and scientific journey from uncovering the problem and identifying its cause, to presenting their case to regulatory authorities and getting a policy response. They also look at how the regulations have been implemented and their impact to date.

The book is dedicated to Oaks, who died in January 2011.

"Wildlife Ecotoxicology: Forensic Approaches" is available for sale and may be ordered from the publisher at: http://www.springer.com

Scientific Publications and Presentations

During calendar year 2011 and FY12, TPF staff and associates produced 83 publications, including 4 books, 27 book chapters, 37 technical papers, 4 reports, and 3 popular articles. This was the highest single year total of publications in the history of The Peregrine Fund.

Rick Watson maintained a list of recent, in-press, in-progress, and planned publications for each field project, and this was periodically reviewed and updated by the respective project leaders.

The two-volume proceedings of the conference entitled "Gyrfalcons and Ptarmigan in a Changing World," which was held in Boise in February 2011, was published later in 2011 under the direction of Rick Watson.

Publication of the long-awaited book on the Maya Forest Raptors Project was accomplished in 2012 under the title of " Neotropical birds of prey: biology and ecology of a forest raptor community." It was edited by David Whitacre and published by Cornell University Press.

Altamirano, T. A., J. T. Ibarra, F. Hernández, I. Rojas, J. Laker, and C. Bonacic. 2012. Nesting habits of the birds of the Andean temperate forests of Chile. Fondo de Protección Ambiental, Santiago, Chile.

Botha, A. J., D. L. Ogada, and M. Z. Virani. 2012. Pan-African vulture summit 2012, April 16-20, 2012, Masai Mara, Kenya. Wildlife without Borders, SASOL, Endangered Wildlife Trust, and The Peregrine Fund, Modderfontein, South Africa.

Campbell-Thompson, E., F. H. Vargas, R. T. Watson, A. Muela, and N. C. Ciceres. 2012. Effect of sex and age at release on the independence of hacked Harpy Eagles. *Journal of Raptor Research* 46:158-167.

Campbell Thompson, E. R. 2012. Reintroduction and ecology of the Harpy Eagle *(Harpia harpyja)* in Central America. Master's thesis, Universidade Federal de Mato Grosso do Sul, Campo Grande, Mato Grosso, Brazil.

Ibarra, J. T., N. Gálvez, A. Gimona, T. A. Altamirano, I. Rojas, A. Hester, J. Laker, and C. Bonacic. 2012. Rufous-legged Owl *(Strix rufipes)* and Austral Pygmy Owl *(Glaucidium nanum)* stand use in a gradient of disrupted and old growth Andean temperate forests, Chile. *Studies on Neotropical Fauna and Environment* 47:33-40.

Kendall, C. J., and M. Z. Virani. 2012. Assessing mortality of African vultures using wing tags and GSM-GPS transmitters. *Journal of Raptor Research* 46:135-140.

Ogada, D. L., M. E. Torchin, M. F. Kinnard, and V. O. Ezenwa. 2012. Effects of vulture declines on facultative scavengers and potential implications for mammalian disease transmission. *Conservation Biology* 26:453-460.

Piana, R. P., and S. J. Marsden. 2012. Diversity, community structure, and niche characteristics within a diurnal raptor assemblage of northwestern Peru. *Condor* 114:279-289.

Reson, E. N. M. 2012. Assessing Maasai attitudes and perceptions toward vultures: a case study of resident Maasai around Maasai Mara National Reserve, Kenya. M.Sc. thesis, Clemson University, Clemson, SC.

Rideout, B. A., I. Stalls, R. Papendick, A. Pessier, B. Puschner, M. E. Finkelstein, D. R. Smith, M. Johnson, M. Mace, R. Stroud, J. Brandt, J. Burnett, C. Parish, J. Petterson, C. Witte, C. Stringfield, K. Orr, J. Zuba, M. Wallace, and J. Grantham. 2012. Patterns of mortality in free-ranging California Condors *(Gymnogyps californianus)*. *Journal of Wildlife Diseases* 48:95-112.

Rivera-Parra, J. L., K. M. Levenstein, JC. Bednarz, F. H. Vargars, V. Carrion, and P. G. Parker. 2012. Implications of goat eradication on the survivorship of the Galapagos Hawk. *Journal of Wildlife Management* 76:1197-1204.

Whitacre, D. F. 2012. Neotropical birds of prey: biology and ecology of a forest raptor community. Cornell University Press, Ithaca, NY.

Chapters include:

Baker, A. J., D. F. Whitacre, and O. Aguirre. 2012. Orange-breasted Falcon. Pages 296-312.

Draheim, G. S., D. F. Whitacre, A. M. Enamorado, O. A. Aguirre, and A. E. Hernández. 2012. White Hawk. Pages 120-138.

Gerhardt, R. P., N. E. Seavy, and R. A. Madrid. 2012. Great Black Hawk. Pages 139-151.

Gerhardt, R. P., D. M. Gerhardt, N. Bonilla, and C. J. Flatten. 2012. Black-and-white Owl. Pages 320-327.

Gerhardt, R. P., D. M. Gerhardt, and M. A. Vásquez. 2012. Swallow-tailed Kite. Pages 60-67.

Gerhardt, R. P., and D. M. Gerhardt. 2012. Mexican Wood Owl. Pages 313-319.

Panasci, T. 2012. Roadside Hawk. Pages 152-163.

Parker, M. N., and D. F. Whitacre. 2012. Bat Falcon. Pages 281-295.

Parker, M. N., A. M. Enamorado, and M. Lima. 2012. Laughing Falcon. Pages 265-280.

Schulze, M. D., J. L. Córdova, N. E. Seavy, and D. F. Whitacre. 2012. Double-toothed Kite. Pages 68-81.

Seavy, N. E., M. D. Schulze, D. F. Whitacre, and M. A. Vásquez. 2012. Plumbeous Kite. Pages 82-92.

Sutter, J. 2012. Crane Hawk. Pages 104-119.

Thorstrom, R. K. 2012. Collared Forest Falcon. Pages 250-264.

Thorstrom, R. K. 2012. Barred Forest Falcon. Pages 234-249.

Thorstrom, R. K. 2012. Bicolored Hawk. Pages 93-103.

Thorstrom, R. K., D. F. Whitacre, J. López, and G. López. 2012. Gray-headed Kite. Pages 39-47.

Whitacre, D. F., and M. D. Schulze. 2012. The Maya forest. Pages 11-38.

Whitacre, D. F., and W. A. Burnham. 2012. The Maya Project. Pages 1-10.

Whitacre, D. F., and W. A. Burnham. 2012. Ecology and conservation of Tikal's raptor fauna. Pages 328-359.

Whitacre, D. F., J. A. Madrid, H. D. Madrid, R. Cruz, C. J. Flatten, and S. H. Funes. 2012. Ornate Hawk-eagle. Pages 203-233.

Whitacre, D. F., J. López, G. López, S. H. Funes, C. J. Flatten, and J. A. Madrid. 2012. Black Hawk-eagle. Pages 185-202.

Whitacre, D. F., and M. A. Vásquez. 2012. Hook-billed Kite. Pages 48-59.

Whitacre, D. F., J. López, and G. López. 2012. Crested Eagle. Pages 164-184

Raptor Conservation Genetics Research

Project Director: *Jeff Johnson*

In combination with field work, genetic research can be used to identify instances where low genetic diversity could affect survival prospects in populations that are vulnerable or of small size. Genetic research is also useful for identifying unique and isolated populations or species worthy of continued conservation or heightened protection.

Since 2003, we have used genetic research in many projects to help conserve biodiversity and identify distinct populations and species. This important tool improves our ability to provide sound scientific justification for conservation.

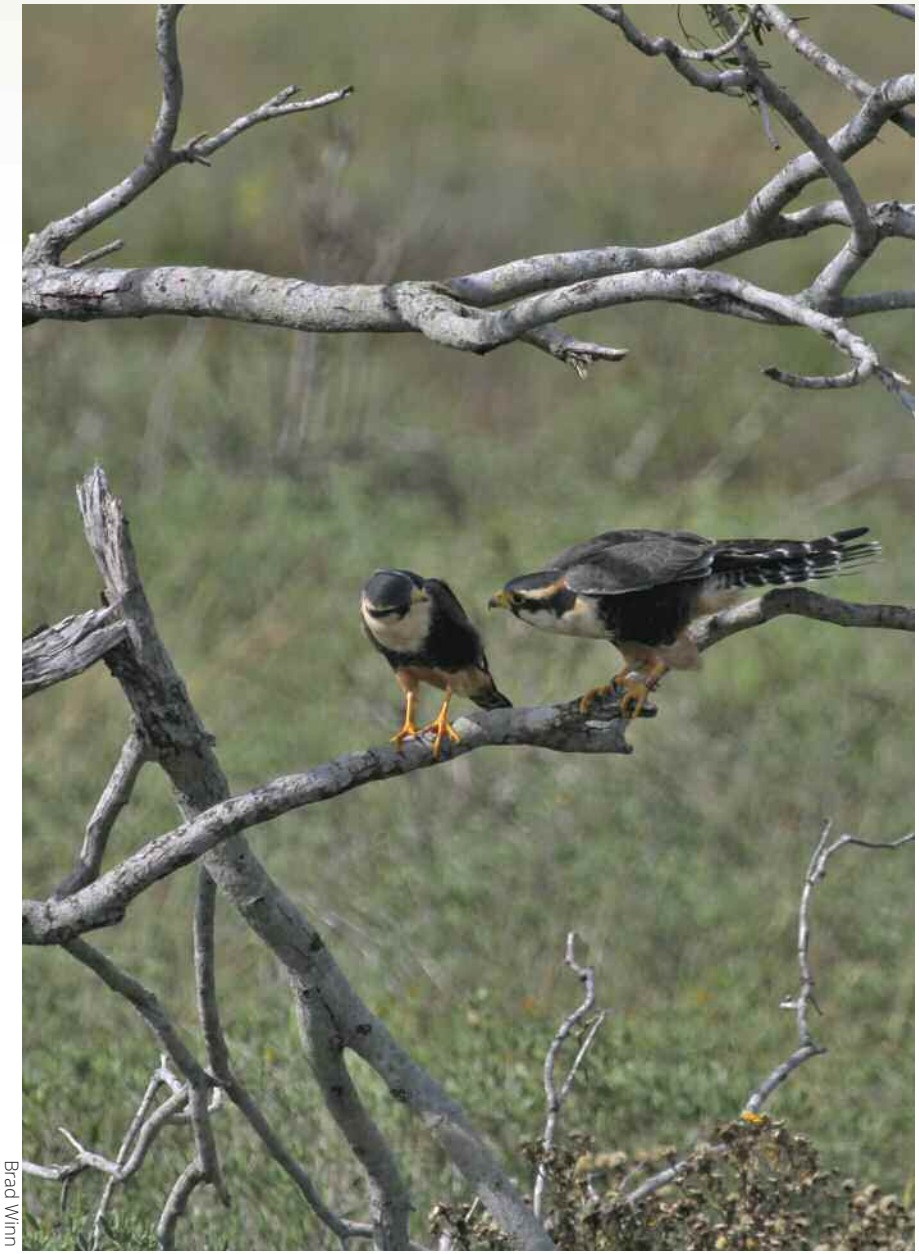
With finite resources available for addressing conservation concerns, genetic data helps us develop our conservation priorities.

Results

***New World Vulture* (Cathartidae) *phylogenetic project*—**in collaboration with Joseph Brown (Univ. of Michigan) and David Mindell, we obtained samples from all representative species within this family and identified evolutionary relationships among species. Final analyses have been completed and a manuscript will be submitted depending on collaborators' schedule.

***Falcon* (Falconidae) *phylogenetic project*—**in collaboration with Jerome Fuchs (Univ. of California-Berkeley and California Academy of Sciences) and David Mindell, progress has been made on a study focused on the phylogenetic relationships among all falcon species. Jerome has completed the final analyses and is currently writing a manuscript. Once completed, this will be the most thorough phylogenetic study on Falconidae to date, and results will help discern relationships among species that will be useful for evolutionary-based questions and management decisions. Two additional taxonomic specific studies have developed from this project and have been published in peer-reviewed journals.

***Gyrfalcon* (F. rusticolus) *genetic color plumage polymorphism project*—**in collaboration with Kurt Burnham and the High Arctic Institute, two studies investigating the genetics of plumage color and the timing of breeding relative to color in Gyrfalcons were completed, producing two peer-reviewed publications. These results provide evidence identifying demographic and genetic



Brad Winn

A pair of Aplomado Falcons **near the Laguna Atascosa Wildlife Refuge in South Texas. To assess the population's sustainability, we plan to examine their genetic diversity in greater detail.**

This important tool improves our ability to provide sound scientific justification for conservation.

factors influencing plumage color geographic distribution in Gyrfalcon, particularly in Greenland. A proposal has been submitted to obtain funds for a Gyrfalcon nest-monitoring project using remote cameras to determine if plumage color is correlated with nesting behavior.

Gyrfalcon **(F. rusticolus)** ***and Peregrine Falcon*** **(F. peregrinus)** ***nest site turnover project*****—**in collaboration with Kurt Burnham and the High Arctic Institute, we are generating genotypes from samples collected between 2006-12 in Thule and Kangerlussuaq, Greenland, to identify individuals at each surveyed nest site. These data will be used in conjunction with data generated from 2002-04 field seasons to investigate turnover rates and site fidelity in the two study areas.

Gyps ***vulture captive breeding project*****—**in collaboration with Chris Bowden, Rhys Green, and Farah Ishtiaq (Royal Society for the Protection of Birds), we initiated a project to obtain genetic data that will allow us to help reduce potential inbreeding effects within the captive breeding population of *Gyps* vultures in India. Genetic data has been generated and analyses conducted. We are currently writing the manuscript for publication.

Peregrine Falcon **(F. peregrinus)** ***inbreeding project*****—**in collaboration with Julia Ponder (Raptor Center, Univ. of Minnesota), Scott Newbold (Sheridan College), and Bob Berry, we initiated a project investigating the effects of inbreeding in the Midwest Peregrine Falcon release program. These data will be useful for identifying demographic and genetic factors correlated with inbreeding depression that may prove useful for the conservation of falcon species at small population sizes.

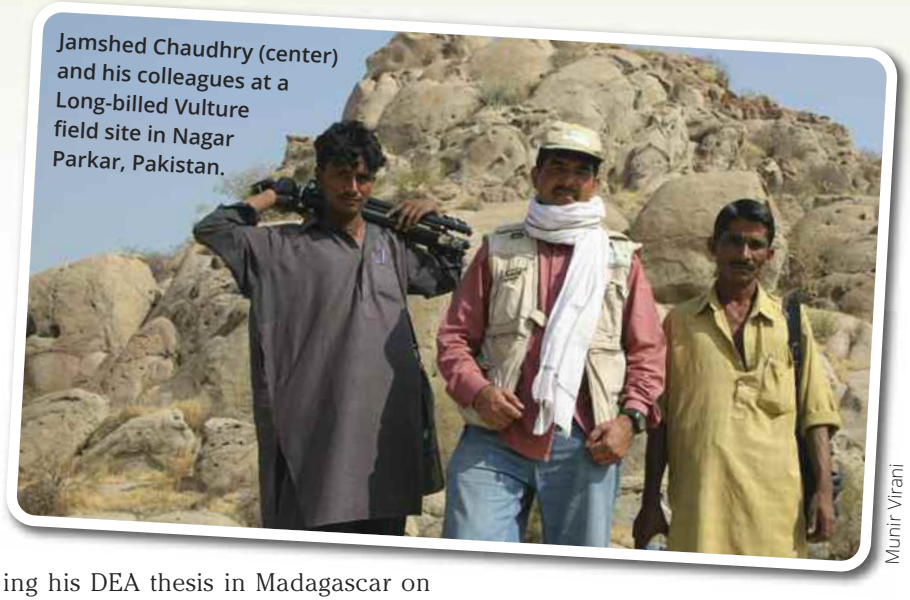
Aplomado Falcon **(F. femoralis)** ***population genetics project*****—**samples were obtained from the South Texas population. We are searching for funds to initiate a project to determine how current levels of genetic diversity and effective population size compare to the founder population and captive-released to Aplomado Falcons between 1993 and 2004. This information will prove useful for assessing both short- and long-term sustainability of this population.❖

Student Education

Our student education program aims to make a lasting contribution to global biodiversity conservation and science by developing a raptor biologist in every country in the world.

In more than 40 years of conservation success, we have found that well-qualified and experienced individuals are the essential driving force for conservation progress and initiatives. Good science, especially knowledge and understanding of biotic processes and systems, is the anchor for effective conservation.

We provide financial and logistical support to students associated with the East Africa Project, Madagascar Project, Neotropical Science and Student Education Project, and the Asian Vulture Project. Most of these students graduate with a master's or doctoral degree from universities in the United States and around the world.



Jamshed Chaudhry (center) and his colleagues at a Long-billed Vulture field site in Nagar Parkar, Pakistan.

Munir Virani

▼Asian Vulture Project

Jamshed Chaudhry continued with his fieldwork for his Ph.D. through Quaid-e-Azam University, Islamabad, Pakistan on population trends of breeding Long-billed Vultures *Gyps indicus* in Nagar Parkar, Pakistan.

▼East Africa Project

Masumi Gudka graduated with her M.Sc. thesis on a study of organochlorine contamination on African Fish Eagles at Lakes Naivasha and Baringo from the University of Cape Town, South Africa.

Eric Ole Reson graduated with his fieldwork on documenting perceptions and attitudes of the Maasi community towards vultures and other birds of prey in Siana and Koiyaki Group ranches of the Masai Mara as part of his M.Sc. study from Clemson University, USA.

Nicholas Gardener graduated with his M.Sc. thesis on habitat use of Long-crested Eagles in southern Uganda from Exeter University in the United Kingdom.

Corinne Kendall graduated with her Ph.D. through Princeton University on vulture ecology and effects of human impacts on them in Kenya.

▼Madagascar Project

Donatien Randrianjafiniasa graduated with his DEA (M.Sc. equivalent) study on the Madagascar Cuckoo-Hawk.

Juliot Carl Ramamonjisoa completed his fourth field season for his Ph.D. study on the owls of northern Madagascar.

The Seing Sam graduated with his DEA (M.Sc. equivalent) on the ecology of the Madagascar Pochard in northern Madagascar.

Yannick Antsa Ramiandrasoa is writing his DEA thesis in Madagascar on ecotourism as a development tool in support of creating the new Bemanevika protected area on behalf of Madagascar Serpent Eagles, Madagascar Red Owls, Henst's Goshawks, and other endangered, endemic raptors, as well as the endangered Madagascar Pochard.

Andriantahina Jean Hubert Rakoto began a DEA degree study of the ethnobotany, ecology, and natural regeneration of plants in Tsimembo Forest, in support of creating the Manambolomaty protected area on behalf of Madagascar Fish Eagles.

Felana Jeanne Henriette Andrianirina began a DEA degree study on the vegetation structure and spatio-evolution of Tsimembo Forest, in support of creating the Manambolomaty protected area on behalf of Madagascar Fish Eagles.

Gilbert Razanfimanjato graduated with his Ph.D. thesis on Madagascar Fish Eagles in December 2011.

Stéphanie Razakaratrimo began a DEA on nesting ecology of Bat Hawks at Tambohorano-Mandrozo Lake protected area.

Evà Andriafanomezantsoa completed her Engineers degree in AgroForestry on development and implementation of the management plan at Manambolomaty Lakes Complex protected area.

Harinosy Ranaivoson began a B.Sc. on traditional customs and their effects on biodiversity conservation at Tambohorano-Mandrozo Lake protected area.

Marius Rakotondratsima postponed his Ph.D. until November 2012, on forest fragment bird communities at Bealanana-Bemanevika protected area.

▼Neotropical Raptor Project

The Peregrine Fund supports eight students working on projects in six countries in the Neotropics. Details are included in pages 30-33 in the Neotropical section.❖

Education Program

Project Director: *Bill Heinrich*

Without public education, our work to conserve threatened and endangered species would be far more difficult, if not impossible. We believe that knowledge allows people to make informed decisions and sparks the passion to power effective solutions.

Our education program is directed at both domestic and international audiences. Our aim is to create awareness campaigns and other activities that allay fear and misunderstanding and build support for the conservation of birds of prey.

The World Center for Birds of Prey draws more than 30,000 visitors each year. Live bird demonstrations, interactive displays, guided tours, films, and child-friendly activities make the Velma Morrison Interpretive Center one of the most popular tourist destinations in Boise, Idaho. Many people also include a docent-led tour of the Archives of Falconry during their visit.

The interpretive center opened in 1994, 10 years after the World Center for Birds of Prey was established. As the public face of our organization, it is a key component in all of our conservation efforts. Our informative displays, public outreach, and skilled expertise make the interpretive center a sought-after resource by birdwatchers, educators, media, and community leaders.

The clicking of cameras **announces the arrival of Wally, a young Eurasian Eagle-owl, as he silently flies over the audience at the new Raptor Ridge.**

Results

More than 36,000 people heard and experienced our education message through our on-site and off-site programs. Nearly 30,000 people visited the interpretive center and 6,478 students participated in the environmental education program.

A significant accomplishment was the completion of a new outdoor seating area, Raptor Ridge. This arena holds 300 people for any outdoor presentation, including the popular Outdoor Fall Flight Demonstrations. Construction began in late August and ended in mid-September. Funding was provided by one of our long-time volunteers, Bill Belknap, and his wife Barbara, who have our thanks for making the flight shows so successful.

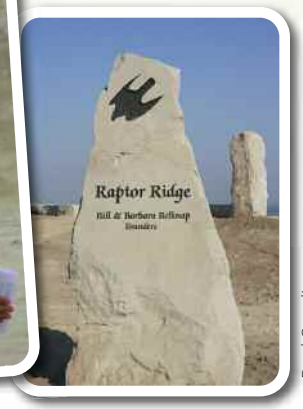
Our philosophy of providing a quality (as opposed to quantity) approach to education programs for school groups is a high priority. Most teachers continue to have a positive reaction to this policy. A total of 5,456 students and teachers comprised of 116 school groups visited the facility on school-endorsed visits. As with previous years, 86% of the students visiting were elementary students, grades K-6. Staff and volunteers conducted 192 environmental education programs with live raptors on-site. We continued to survey teachers via email after their visit to the facility with their class. A total of 87 teachers completed the survey.

We continued to reach out to local organizations, events, and schools through off-site events with live raptors. We participated in 31 off-site events with a total attendance of 8,354 people.

©Jim Shane, photobyjimshane.com

Paul Spurling

Bruce Parks



Paul Spurling

A Swainson's Hawk **is one of the many raptor ambassadors ready to demonstrate impressive flight skills for visitors. Above: *Bill Belknap* addresses Raptor Ridge's first audience after an introduction by President Peter Jenny (right).**

A significant accomplishment was the completion of a new outdoor seating area, Raptor Ridge, made possible by a donation from Bill and Barbara Belknap.

These programs included presentations to students at seven Title I schools and other elementary, middle, and high schools in Idaho and Oregon. In most cases, the entire school population attended the presentations, which focused on birds of prey, the projects and history of The Peregrine Fund, and the importance of the conservation of birds of prey and their environments.

For the second year, we hosted two sponsored Family Field Trip Saturday events, which were free for visitors. Over the two days (one in January, one in February), 2,300 people attended. Sponsorship included a full week of radio advertising and a remote broadcast during both events. Families participated in more than 900 educational scavenger hunts and 1,100 hands-on craft activities. These two events increased our visitation during our slowest months.

Data collected from 575 entries in our electronic guest book at the interpretive center showed that our primary visitation came from Idaho, which represented 67 % of the entries. This was a 7% increase in Idaho visitors over the previous year. California and Washington both came in at 9% of our visitation. Friends and family referrals continue to be the primary method visitors learn about us, although our rack card/brochure and the freeway sign also drive a significant number of visitors.

Additional marketing and efforts to create changing programs have improved the overall visitor experience and increased sales of memberships. To encourage more visitors to become members of The Peregrine Fund, we added signage to inform them of member benefits, including that their paid admission could be upgraded the same day to a membership. This effort produced 224 new memberships—an increase of 51% in number of memberships over the previous year.

An informative photo exhibit at the interpretive center featured The Peregrine Fund's work in Madagascar. We created the display to inform visitors of the work we do internationally by focusing on research and education. We plan to create a similar new exhibit annually.

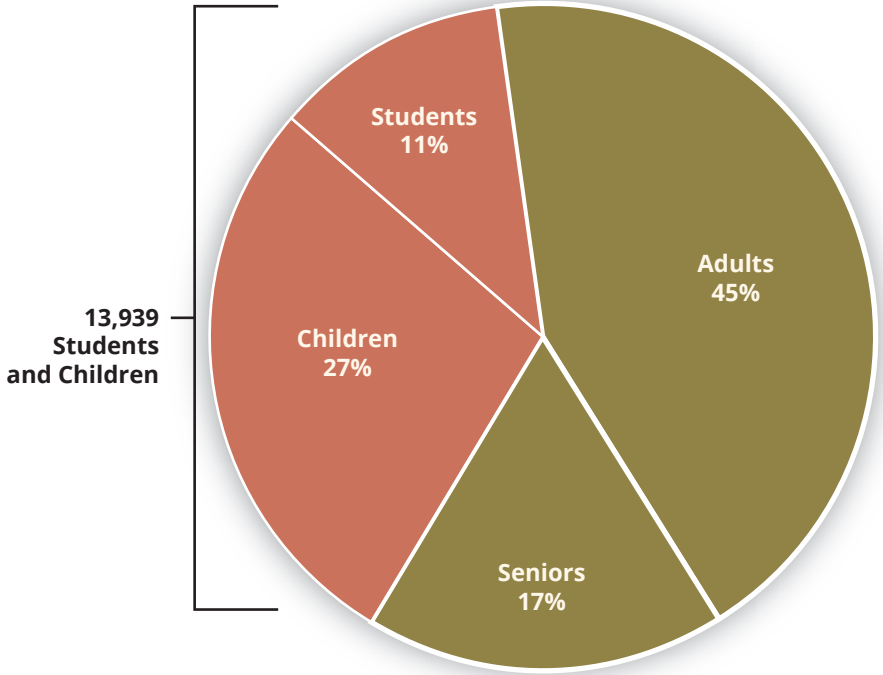
The east end of the viewing hall where visitors can observe live birds of prey was renovated to match the west end of the hall. New glass and larger viewing widows were added. The walls were painted inside the chambers for the Aplomado Falcons and the Turkey Vulture.

We introduced some new marketing strategies, including a Facebook page for the interpretive center. One of our sponsors, Larry H. Miller Subaru, donated the lease for a Subaru Outback

to be used for educational outreach. The company also provided graphics for a vehicle wrap to create a moving billboard for us.

We added two new Aplomado Falcons, a male Western Screech Owl, a male Harris's Hawk, a male Eurasian Eagle Owl, and a male Peregrine Falcon to our educational raptor inventory. We added three new staff members to the education department: a gift shop manager, a volunteer coordinator/education specialist, and a director, Bill Heinrich, to replace Interpretive Center Director Jack Cafferty and Operations Manager Nick Piccono.

A total of 69 volunteers contributed 6,253 hours to the education program. They worked in the gift shop, conducted tours of the interpretive center and The Archives of Falconry, and performed essential miscellaneous tasks. We are indebted to their service and contributions. We continued to host orientations for interested volunteers and plan to update our current training procedures. ❖



Of the more than 36,000 visitors to the World Center for Birds of Prey, 38% were children visiting with their families or on school field trips.

The Archives of Falconry

Curator: *John R. Swift*

Before The Archives of Falconry existed, the death of a falconer often meant the loss, too, of valuable photographs, documents, art, books, and artifacts. The archives was established in 1986 to collect these items — it remains the only one in the world whose sole purpose is to preserve materials related to the hunting sport of falconry.

An important part of our work is to educate the public about falconry and the contributions of falconers to raptor conservation. We do this with informative displays and interactive exhibits that are open daily.

We also are a place where people gather to share their passion for falconry. Each spring, our annual rendezvous attracts falconers from near and far to celebrate their sport, view our collections, and honor those who have died.

In North America, falconry has been practiced for only a century, a short time when compared to the 4,500-year history of falconry worldwide. The archives shows the influence of Europe, the Middle East, and Asia on North American falconry and reflects the international scope of our collections.

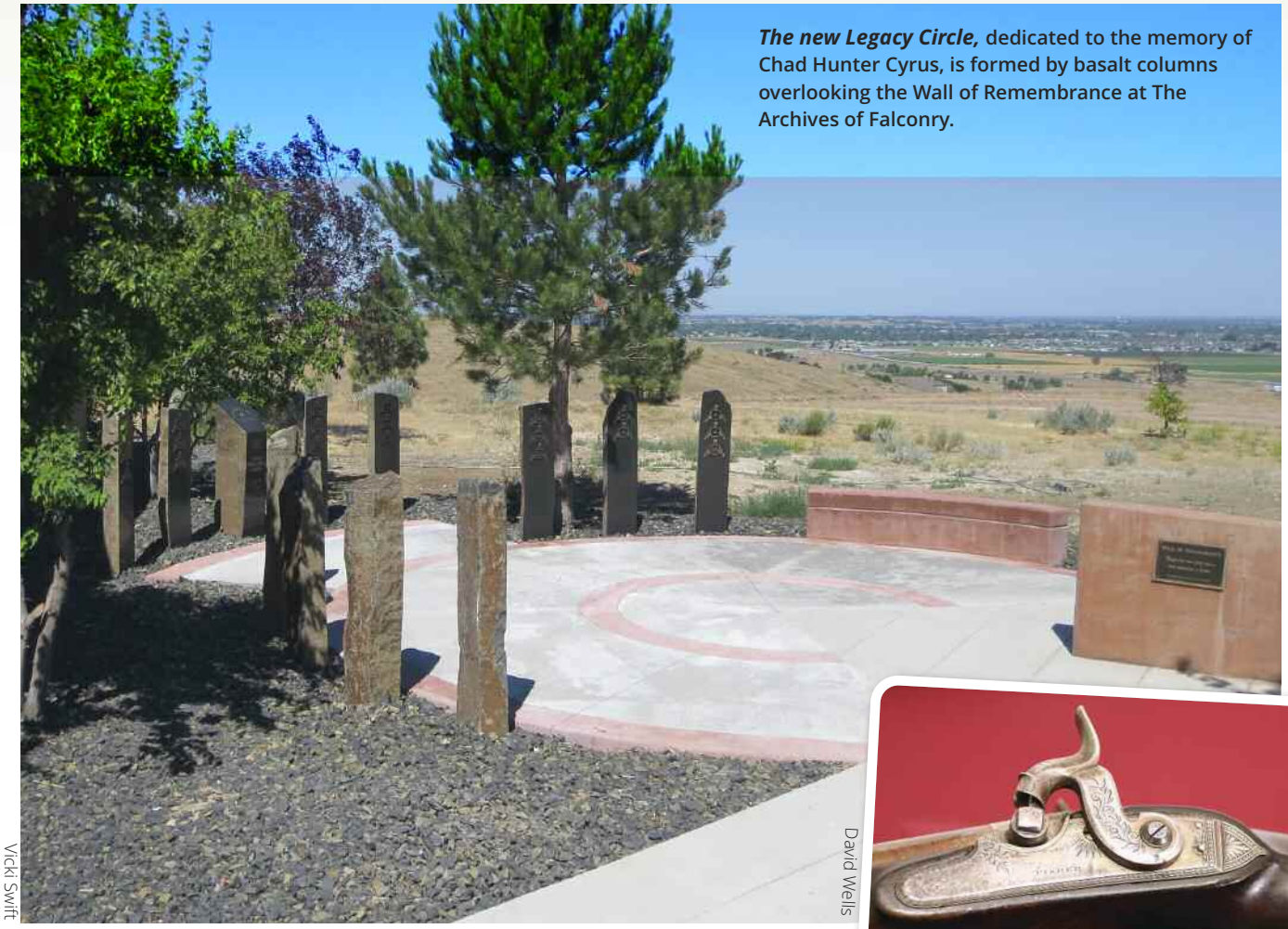
Recognized for its significance to falconry, the archives was selected as the site for a museum dedicated to the memory of the late Sheikh Zayed, a falconer and first president of the United Arab Emirates. The addition added to the growing international prestige of The Archives of Falconry.

▼Results

The Archives continued to fulfill its primary mission to collect and preserve falconry materials with the addition of more than 100 gifts.

Four quarterly issues of the Heritage e-newsletter were published and e-mailed to 1,200 Archives' supporters and posted on our Facebook page, which has more than 2,700 followers. Curator John Swift represented the Archives at several national and state club events as well as the International Falconry Festival in Abu Dhabi.

The Archives of Falconry hosted the fifth annual Spring Rendezvous with more than 175 falconers in attendance. The rendezvous featured a special exhibition of drawings and paintings by Robert Katona. Eleven falconers were honored on the Wall of Remembrance, bringing the total recognized to 77. The Book of Remembrance, which presents a pictorial and biographical history of each falconer on the Wall, was displayed at several national and state events.



The new Legacy Circle, **dedicated to the memory of Chad Hunter Cyrus, is formed by basalt columns overlooking the Wall of Remembrance at The Archives of Falconry.**

Vicki Swift

David Wells

A new Legacy Circle was created to recognize active donors who have contributed a minimum of $10,000 cumulatively to the Archives of Falconry. Each donor is recognized with a special bronze hood-shaped plaque mounted on a basalt pillar placed in a circle. This circle of donors represents the lifetime of giving that these individuals and families have donated to support the legacy of falconry.

Pete and Lucy Widener, through the Eyas Foundation, constructed the Legacy Circle in memory of their friend and falconer Chad Hunter Cyrus. Chad's mother, Sunnie Shea, participated in a special dedication ceremony of the Legacy Circle, which was held in conjunction with the Wall of Remembrance installation. ❖

A shotgun **made for Colonel Thomas Thornton is among the many treasures received at The Archives in 2012.**

Major acquisitions

Set of 60 large photographs of Peregrine eyries in Vermont by egg collector Karl Pember

Cloth hawking bag from Mohamed Al Bowardi (UAE)

Large display case from Don Anderson showcasing falconry equipment

Copy of Ronald Stevens' Observations on Modern Falconry, 1972, from Steve Platt, with nine original pencil drawings of Platt and falcons by artist John Langford

Four leather hoods made by Roger Upton (UK)

Original watercolor of a falcon with a Dutch hood by Robert Katona, from William Mallon

Dutch-style hood by Bill Barbour

Modern falconry book by Noriko Otsuka (Japan)

Decorated leather hawking bags by Marc Pitteman (Belgium)

Self-published catalog of the library of Tom Cantella

Falconry equipment from Jim Adamson

Six DVDs of NAFA presentations from Larry Miller

Historic antique shotgun custom-made for Col. Thomas Thornton from Tony James (UK).

We thank the following individuals and institutions for their cooperation and partnership in 2012. Many are donors as well, listed in pages 54-57.

94%

of donations we receive are used for programs

▼All Projects

Dr. Jeff Johnson, University of North Texas
Hal Maxey

▼Aplomado Falcon Program

Tim Anderson
Lee and Ramona Bass
Ing. Erique Baeza
Dewey & Linda Brown
Bureau of Land Management
John Coffman
A.T. & Cinda Cole
Jimmy and Suanne Delk
Department of Defense at White Sands Missile Range
Beau Hardegree
Tom Hass and Janice Newman
Ephraim Hinojosa
Richard and Sandi Hoover
Brad Kelley
Kendal Keyes
LightHawk
Alberto Macias
Gus Martin
Carl Mattson and Julie Boyd
Jon and Jackie Means
Meridian Veterinary Clinic, Dr. Scott Higer
Clay and Jody Miller
Angel Montoya
Miguel Mora, Texas A & M University
Richard Moore
Johnny & Margaret Mounyo
Mustang Island State Park
Ruth Mutch
New Mexico Bureau of Land Management
New Mexico Department of Game and Fish
New Mexico Ranch Properties
New Mexico State Land Office
Freddy Nieto
The Port of Brownsville
The Raptor Center, Dr. Pat Redig
Damon F. Reeves
Wade Ruddock
Tanner Schaub
State of Texas
Jerry Taylor
Texas Parks and Wildlife Department
Turner Endangered Species Fund
Turner Enterprises Inc.
U.S. Fish and Wildlife Service
U.S. Fish and Wildlife Service, Coastal Bays and Estuaries Program
U.S. Fish and Wildlife Service Private Stewardship Program
Tom Waddell
Zoological Society of San Diego, Dr. Bruce Rideout

▼The Archives of Falconry

Jack and Mara Brannon
Peter Devers
Tony Huston
Ashley Neubrand
Natalie Nicholson
Kathleen Orlenko
James Thomas
Nick Vanhole

▼California Condor Program

Arizona Game and Fish Department
Arizona Public Service
Arizona Strip Bureau of Land Management
Lee Banning
Justus Bauschinger
Boise State University
Bureau of Land Management
J. Charlie Fergason
Habitat, Dr. Reed Linenberger
Liberty Wildlife, Dr. Kathy Orr
Meridian Veterinary Clinic, Dr. Scott Higer
National Park Service
Victor Neese
Maggie Sacher, Lee's Ferry Lodge
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Statement of Activities

FOR THE YEAR ENDED SEPTEMBER 30

UNRESTRICTED OPERATIONS

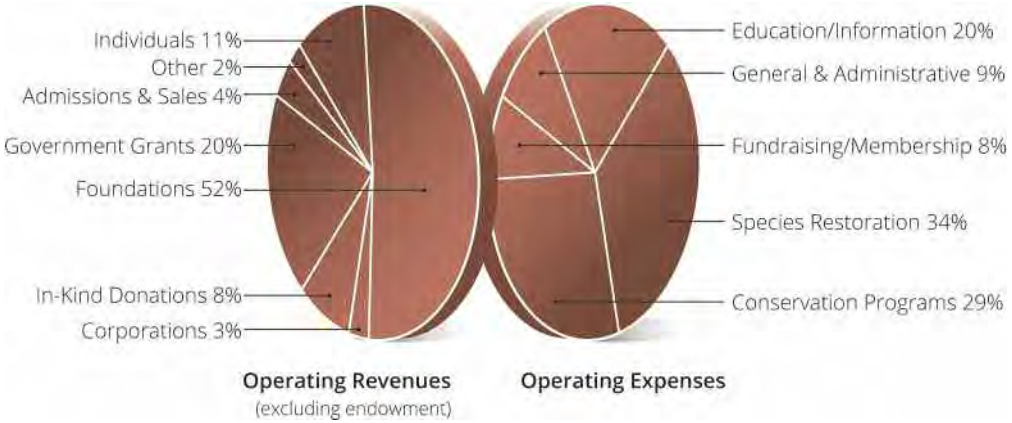
Revenues	2012	2011
Contributions utilized *(note 1)*	$3,173,845	$3,778,693
Government grants	1,012,554	972,492
In-kind revenues	454,638	385,639
Admissions and sales	200,731	210,837
Endowment funds utilized	513,204	465,400
Special event	—	175,064
Other	106,673	23,151
Total unrestricted revenues, gains, and other support	**$5,461,645**	**$6,011,276**
Expenses		
PROGRAM EXPENSES		
Species restoration	$2,008,812	$2,144,685
Conservation programs	1,685,790	1,670,386
Education / information	1,154,060	1,177,342
Total program expenses	**$4,848,662**	**$4,992,413**
SUPPORT SERVICES EXPENSES		
Administration	$ 506,356	$ 466,190
Fundraising	347,888	390,164
Membership	108,145	122,286
Total support services expenses	**$ 962,389**	**$ 978,640**
Total expenses-operations	**$5,811,051**	**$5,971,053**
OPERATING REVENUES OVER OPERATING EXPENSES	**(349,406)**	**40,223**

NON-OPERATING ACTIVITIES

Capital		
Contributions utilized to purchase fixed assets	$ 203,901	$ 38,652
Depreciation on Fixed Assets	(318,551)	(320,307)
Gain on asset disposition	5,311	(33)
Endowment		
Bequests and endowments	36,373	215,191
Investment income (loss)	1,862,196	509,052
Endowment funds utilized	(513,204)	(465,400)
Pledges and contributions designated for future years		
Pledges and contributions	1,034,496	344,153
Prior year's revenue used in current year	(811,857)	(683,506)
TOTAL NON-OPERATING ACTIVITIES	**$1,498,665**	**$(362,198)**
Increase (decrease) in net assets	1,149,259	(321,975)
Net assets at beginning of year	19,135,147	19,457,122
Net assets at end of year	$20,284,406	$19,135,147

Note 1—Contributions utilized in 2012 includes current year contributions of $2,361,988 and prior years' contributions released from restrictions of $811,857.

The financial results depicted are derived from The Peregrine Fund's audited September 30, 2012 financial statements, which contain an unqualified opinion. The complete audited financial statements can be obtained by contacting The Peregrine Fund, Administrator, 5668 W. Flying Hawk Lane, Boise, ID 83709.



Statement of Financial Position

AT SEPTEMBER 30

Assets	**2012**	**2011**
Cash and cash equivalents	$ 871,098	$ 1,322,262
Grants receivable	263,394	258,730
Pledges and other receivables	826,125	456,188
Inventory, prepaids, and other assets	94,521	125,399
Property and equipment (net of depreciation)	4,695,614	4,825,453
Archives collection	2,327,603	2,307,103
Endowment assets	11,375,393	9,964,306
TOTAL ASSETS	**$20,453,748**	**$19,259,441**
Liabilities and Net Assets		
LIABILITIES		
Accounts payable	128,486	64,117
Accrued taxes and expenses	40,856	50,610
Deferred revenue	-	9,567
TOTAL LIABILITIES	**$ 169,342**	**$ 124,294**
NET ASSETS		
Unrestricted	18,617,030	17,732,890
Temporarily restricted	1,667,376	1,402,257
TOTAL NET ASSETS	**$ 20,284,406**	**$19,135,147**
TOTAL LIABILITIES AND NET ASSETS	**$ 20,453,748**	**$19,259,441**

Legacy Circle at The Archives of Falconry was dedicated in 2012.

A legacy set in stone...

Members of The Peregrine Fund's Legacy Circle commit to making a contribution by bequest or other planned gift from their estate. The gift may be directed to Conservation, the Education Program, or The Archives of Falconry. Members receive:

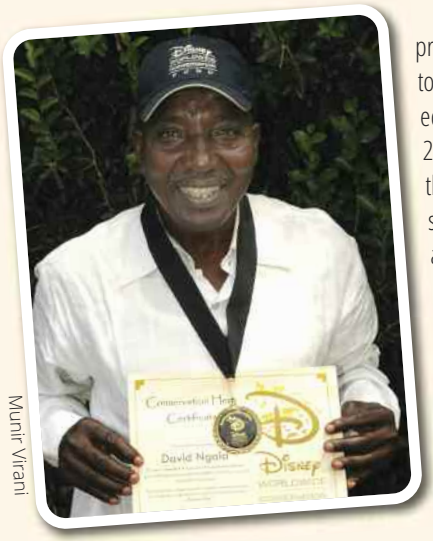
- a beautiful engraved paperweight
- an invitation to join an annual call with leaders of the organization
- public recognition, if they choose, at our headquarters, in our annual report, website, and other publications
- invitations to special events

To join the Legacy Circle or learn more, contact us at legacycircle@peregrinefund.org or 208-362-3716.

2012 Legacy Circle Members include:

Robert & Julie Bagley
Paul & Lynn Beecroft
Bill and Barbara Belknap
Bob Berry
Frank M. Bond
Sterling Bunnell
Pat & Kurt Burnham
Tom & Renetta Cade
California Hawking Club
S. Kent Carnie
Keith P. Carpenter
Ronald G. Clarke
Robert J. Collins
William Cornatzer
Jim & Nancy Cranmer
Peter B. Devers
Frank C. & Linda S. Ely
Jim & Betty Enderson
Eyas Foundation
David Frank
Tom C. & Dottie Gossard
Don Heidt
Susan Bowman
Tony Huston
Tony James
Clifford & Janna Kellogg
Bill Mallon Jr.
Stan Marcus
Bill & Joan Mattox
Heinz K. & Elizabeth A. Meng
Brian & Ruth Mutch
Natalie Nicholson
North American Falconers Association
Ken & Rebecca Riddle
John & Vicki Swift
Jim Weaver
Gary D. Weddle

Forest protector named Disney Conservation Hero



Munir Virani

David Ngala, who has provided invaluable support to The Peregrine Fund's projects in Africa, was named a 2012 Conservation Hero by the Disney Worldwide Conservation Fund. Ngala is among six honorees from six countries and three continents.

Munir Virani, director of The Peregrine Fund's projects in Africa, nominated Ngala for the award.

"The uniqueness of David's work stems from his love and passion for birds as ambassadors to convey the forest conservation message and achieve habitat protection and awareness," Virani said. "He has inspired hundreds of forest researchers, thousands of foreign visitors and hundreds of thousands of local villagers."

Ngala works in the Arabuko-Sokoke Forest, home to the endangered Sokoke Scops Owl and other rare animals that depend on the remaining forest on Kenya's east coast. Ngala tracks and stops poachers from illegally taking wildlife and timber. He has located more than 1,400 animal traps and helped arrest poachers by documenting nearly 900 paths they use.

When Ngala began to report signs of destructive activity in the forest, he faced intense criticism but attempts to have him removed from his post were unsuccessful and he continued to protect the forest he says he loves "as my parents." Eventually, Ngala won over local leaders and enlisted their help to successfully stop clear-cutting proposals.

Ngala has helped plant thousands of seedlings in the forest, a process that influenced local residents about the importance of tree planting. He also has formed local conservation groups and helped people develop innovative alternative sources of income to reduce pressure on forest resources.

Staff

United States

David Anderson
Arlis Barnes
Linda Behrman
Gabe Border
Erin Brannon
Joell Brown
Pat Burnham
Taiana Carvalho
Jessica Cate
David Cline
Marta Curti
Donna Daniels
Sam Davila
Edward Feltes
Genevieve Gerke
Matt Giovanni
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Bill Heinrich
Grainger Hunt
Marti Jenkins
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Paul Juergens
Meagan Kaiser
Kristy Marks
Amel Mustic
Brian Mutch
Julia Nadal
Trish Nixon
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Bruce Parks
Shaun Putz
Travis Rosenberry
Cal Sandfort
Amy Siedenstrang
Heather Springsteed
Paul Spurling
Connie Stanger
Cindy Thiel
Russell Thorstrom
Rick Watson
Eric Weis
David Wells
Susan Whaley
Aaron Wuori

Archivist, John Swift
Archivist Emeritus,
S. Kent Carnie

International

Neotropics
Hilario "Nogini" Jorge Blanco
Pastor "Chivero" de Leon
Julio Gañan
Jonathan Urbina
Hernan Vargas

Pan Africa
Darcy Ogada
Munir Virani

Madagascar
Tolojanahary R. A. Andriamalala
Adrien Batou
Be Berthin
Noel Augustin Bonhomme
Eloi Fanameha
Jean Louis Andry Hiankinantsoa
Jaomizara
Eugene Ladoany
Kalavah R. Loukman
Jules Mampiandra
Moïse
Monesse
Charles Rabearivelo
Berthine Rafarasoa
Jeannette Rajesy
Marius P. H. Rakotondratsima
Michel Rakotoson
Bruno Randrianarimanana
Donatien Randrianjafiniasa
Gaston Raoelison
Ernest Razafimandimby
Gilbert Razafimanjato
Joseph Razafindrasolo
Jacquot M. Razanakoto Lova
Lily-Arison Rene de Roland
T. Seing Sam
Gilbert Tohaky
Soalihy Tongamoelinakily

Volunteers

Velma Morrison Interpretive Center

Deb Anderson
Emily Anderson
Michelle Axtell
Bill Belknap
Kathy Belknap
Anne Blair
Maud Bolstad
Tom Bradley
Jill Bragdon
Christa Braun
Garrett Browning
Ray Brucks
Amanda Brumbaugh
Nickee Brumbaugh
Gina Bush
Kate Bush
Sharon Colby
Deanna Combs
Christy Commons
Lisa Craig
Ron Crayton
Helen Crewse
Scott Dowdle
Kimberly Dunn
Jordann Engelbrecht
Maryon Evans
Leo Faddis
Kit Fawcett
Claudia Fernsworth
Barbara Fordham
Beverly Fransen
Joni Frey
Mike Garets
Barbara Girard
Stephen Gradhandt
Val Grimes
Pennie Guy
Lindsey Hamilton
Kathryn Hampton
Lisa Hatch
Bonnie Helzer
Kathryn Hobson
Pat Hovland
Dale Howard
Bart Kline
Claudia Laushman
Connie Leavitt
Steve Lewis
Eileen Loerch
Pam Lowe
Jack Lupien
Jane Matthews
Milt Melzian
Dave Oliver
Bruce Parks
Sheryl Parks
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Sarah Poppino
Fred Pugh
Mark Purdy
Betty Purdy
Bill Rath
Marcia Ross
Denise Rotell
Dean Sangrey
Michael Shaw
Chan Springer
Diann Stone
Dick Thatcher
Toree Tuck
Vivian Upton
Paula Vawser
Mckenzie Walker
Siri Walther
Judy Weidner
Rebekah Whitney
Allan Wylie
Mark Alten
Anna Ives
Chris Porterfield
Ashley Neubrand
Rachel Wong
Jordan Mason
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Lynn Nelson
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Nick Juza
Deb Arnswald
Kaden Stanger

The Archives of Falconry

Paul Beecroft
Phil Bucher
S. Kent Carnie
Dr. Javier Ceballos
Steve Chindgren
Bob Collins
Peter Devers
Amy Fisher
Don Garlock
Jim Hansen
Bill Mattox
Ashley Neubrand
Natalie Nicholson
Kathleen Orlenko
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Lori Smith
John Swift
Vicki Swift
H. W. "Dick" ten Bosch
James Thomas
Nick Vanhole

Library/GRIN

Julie Kiff
Chris Restall
Jesse Timberlake

California Condor

Dorothy Tinkler, Ph.D.

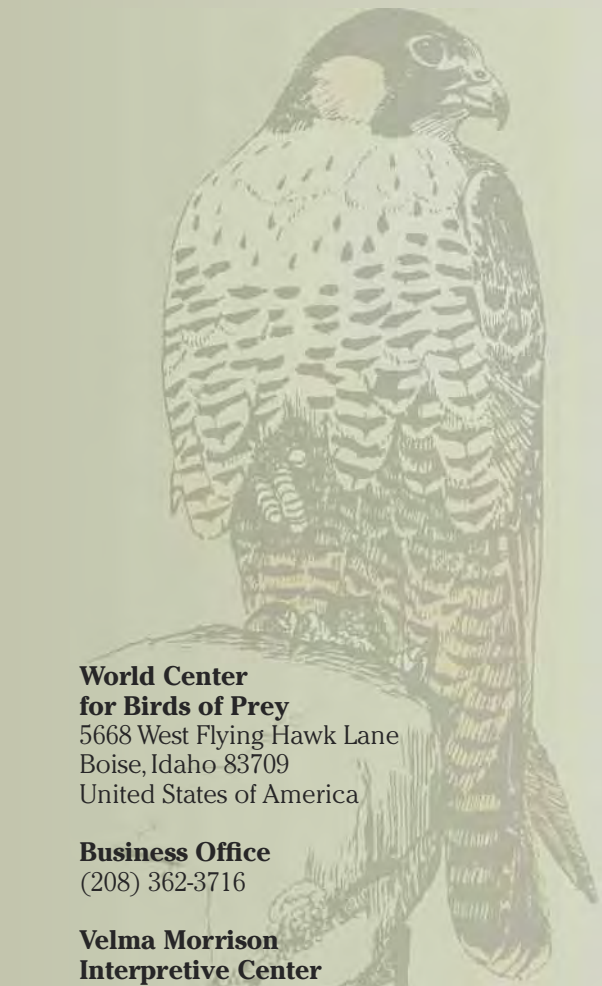
Asian Vulture Crisis Project

Patrick Benson

East Africa Project

Shiv Kapila
Hetal Patel

Thank you for your partnership.



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THE PEREGRINE FUND BOARD OF DIRECTORS