



NEOTROPICAL RAPTOR NETWORK (NRN)

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Andean Condor, Nature and Culture in

Ecuador By Patricio Meza Saltos, Asociación Cultura & Tierra (ACT), Proyecto Kuntur- SIMBIOE / The Peregrine Fund, proyectocondor_ecuador@hotmail.com

En Ecuador, step by step.

The majestic Andean Condor (*Vultur gryphus*) is found throughout the Andes Mountain Range. To many it represents identity, freedom and strength, and it was once considered to be an intermediary spirit between the sun and the earth. In 1991, July 7th was declared the official National Day of the Andean Condor in Ecuador. On this day, The Ecuadorian Ornithological Corporation (CECIA) hosted a variety of activities related to condor conservation. Perhaps the most important activity was the first “Census Walk”, where participants counted condors at 40 different sites along the mountain range. This effort provided a provisional estimate of 42 condors in the country. The same organization conducted another census in 1996, and estimated the condor population to be at about 100 individuals in the wild.



Culture. Monument of a condor hunting a calf on display in a city park in Ángel, Ecuador

Later, in 1999, Yánez & Yánez identified two nests, six roosting sites, and some preferred feeding areas of the Andean Condor in the Ecological Reserves of Cayambe-Coca and Cotacachi-Cayapas, in the northern part of the country.

In 2002, Yánez & Cevallos began an Andean Condor Conservation Project, whose main goal was to determine the actual number of wild condors in the country. The results were alarming – only 70 individuals were documented. Lack of food, hun-

(Continued on page 6)



Spizaeetus isidori Des Murs, 1845
Santafé de Bogotá, Colombia

III NEOTROPICAL RAPTOR CONFERENCE 28-30 OCTOBER 2009

The Neotropical Raptor Network presents the III Neotropical Raptor Conference which will be held in Bogota, Colombia on 28-30 October, 2009. The goal of the conference is to promote communication and interaction among raptor enthusiasts that live, study or work in the Neotropics.

Some conference highlights will include: a pre-conference workshop on biomedicine; a symposium on the conservation of birds of prey; and a workshop led by several of the authors of the book *Raptor Research and Management Techniques* which will cover such topics as marking and capture Techniques, raptor identification, and reproduction.

For more information, visit: www.neotropicalraptors.org

Understanding the Orange-breasted Falcon Population in

Belize By Yeray Seminario, The Peregrine Fund, yerasyd@gmail.com

Arriving on a private flight from Wyoming, five rare Orange-breasted Falcon (*Falco deiroleucus*) chicks landed at the airport in Belize on 26 June, 2008. This was the third year that The Peregrine Fund has released young individuals of this species in Belize, as part of the study and conservation of this bird in Mesoamerica.

Our work with Orange-breasted Falcons (OBFs) includes studying the remnant population in Belize, Guatemala and Panama; searching for new pairs; and conducting experimental releases in the Mountain Pine Ridge in Belize.

There are multiple reasons that these releases are being carried out. First, they are a means to learn as much as possible about the behavior of the species and problems that might arise during the release. This knowledge can serve to then maximize the survival of young birds prior to their dispersal. Second, releasing unrelated individuals is a way to enhance the genetic fitness of the local population.

Preliminary data suggest that this Northernmost OBF population, thought to be isolated by some 900 miles from the largely unknown South American population, may be declin-

ing. We are trying to identify those factors contributing to this apparent decline in both occupied nesting sites and productivity. More time is needed to understand exactly what is happening with the OBF population in Belize and Guatemala, but these experimental releases are adding genetic diversity to this small population.



© Yeray Seminario
One of the 7 wild juveniles that hatched in Belize this year.

The young falcons are bred in climate controlled breeding chambers in Wolf, Wyoming by Robert B. Berry, one of the founders of The Peregrine Fund,

and the Director of the OBF Program. Once they arrive in Belize, the young falcons are transported to the Mountain Pine Ridge, in the Maya Mountains, a truly unique granite ecosystem surrounded by Belizean rainforest, consisting of poor acidic clay soils that sustain dense pine trees *Pinus Caribaea* and low thickets (*Tripsacum latifolium*, *Miconia albicans* and *Dicranopteris pectinata*, among others). A plague of Pine Beetles (*Dendroctonus frontalis*) in 1999 drastically changed the landscape of the Mountain Pine Ridge, killing approximately 90% of the pines, and, similar to fire, may have improved the foraging opportunities for the resident falcon population.

The young falcons are released through a technique called "hacking", more specifically through a method known as "tame-hack," in which the young birds are raised by hand in small groups to prevent imprinting, but are quite tame. This technique was coincidentally successful in the release of Aplomado Falcons (*Falco femoralis*) conducted by The Peregrine Fund in Texas, and it has worked very well with the Orange-breasted Falcons.

The hack site consists of a wooden box set atop a platform, situated on the



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Three Orange-breasted Falcon juveniles, released by The Peregrine Fund in Mountain Pine Ridge, Belize



© Yeray Seminario

Released falcons are fitted with a band and a leg-mount transmitter to help monitor their movements after dispersal.



© Yeray Seminario

Wild adult Orange-breasted Falcon in Buena Vista, Guatemala

top of a live pine tree, all of which is easily accessible with a ladder. The trunk of the tree is surrounded by a small moat, which helps prevent potentially harmful ants from climbing the tree, as well as sheets of aluminum to help stop land predators from climbing up to the box. On one side of the box there is a door which allows us to enter if necessary. One entire side is barred and screened so that the falcons can interact visually with the outside world.

The falcons are ideally released at between 35-45 days of age, though we have released birds older than that both with and without any problems. Once the birds are released they are fed quail two times a day: first thing in the morning and then again in the late afternoon. During this time, the falcons exhibit much curiosity by exploring the platform and remaining alert to predators. They are very vocal and communicate frequently with each other, often sounding the alarm when they detect the presence of danger. The Black and White Hawk Eagle (*Spizastur melanoleucus*) has been a major predator to the OBF release program.

Without a doubt, one of the most exciting moments is the first flight. This happens usually when they are between 50-

60 days of age, although the males are often more precocious. As a general rule, the first flights are awkward and uncontrolled, but after only a few tries, they fly like experts, although they still need quite a bit more time (up to three months) to develop their ability to capture prey in flight. Ultimately, their strength, body weight, large feet and beak enable them to capture prey of considerable size, including psitacids that could seriously harm even an adult falcon with their strong bills.

The first flight is also one of the most critical moments in the release process. If the falcon has become sufficiently bonded to the release site, it will return within a few hours or a day or two in order to feed. If the falcon does not return on its own, there is a risk that it will become lost, and potentially die due to hunger or dehydration. It is important to track these falcons during this critical time, so they are fitted with radio transmitters. Thanks to this technology, we were able to locate one of last year's released birds close to Tikal National Park in Guatemala, roughly 80 km away, six months after this falcon was released. That same year we saw that

the juveniles dispersed up to 10 km. less than one month after being released.

There is still much to be learned about these fascinating raptors. Next year, we hope to release more falcons using the tame hack procedure. One of the falcons that we released last year returned this year and interacted almost daily with this year's birds. This was a giant step in demonstrating the success in using this technique with this species. We hope to have many more re-sightings of these color banded individuals in the future. We will also continue to monitor the wild pairs, which is essential for us to better understand the problems that could be affecting the Central American population of this beautiful raptor.

Acknowledgements:

Field work during the releases is difficult and it would not be possible without the help of our volunteers: Ana Grau, Chris Eardley, Aldo Ortiz and Erin Strasser. We owe an enormous thanks to Wolf Creek Charitable Foundation, Hidden Valley Inn and Trevor Roe for their unconditional support for the project, and to George Headley for allowing us to use his land for the release of these young falcons.

OBF Program Director: Robert B. Berry

Director of Field Operations: Angel Muela

Assistant Director Field Operations: Marta Curti

Assistant Director Field Operations: Yeray Seminario

* * *

Raptor Survey in the Upper Rio Doce Valley, Southeast Brazil

By Luiz Salvador, Neotropical Research, Grupo de Estudo para a Conservação da Fauna Neotropical, neotropicalresearch@hotmail.com



NEOTROPICAL RESEARCH 2006

Luiz Salvador

Once a refuge for typical forest raptors, today the Rio Doce and Santa Cruz do Escalvado are habitats for open area species

The Atlantic Rainforest is one of the world's most disrupted and threatened ecosystems and was the first Brazilian biome to be explored after the Portuguese arrival in 1500. Subsequent economic cycles and fast population growth within its original range in the last 508 years have severely affected its singular ecological integrity. Less than 8% of its 1,500,000 km² of native vegetal cover still remains in form of forest fragments; most of them isolated from each other by large monoculture fields, cattle farms and urban areas.

This huge devastation deeply modified the forest's original physiognomy, leading to lots of local extinctions. Many raptor species are among the victims of deforestation due to their high sensibility to habitat fragmentation and their reliance on large forest areas to maintain healthy populations.

With the intent to detect the raptorial fauna's susceptibility to fragmentation and habitat loss, Biologists from Neotropical Research – Grupo de

Estudo para a Conservação da Fauna Neotropical (MG/Brazil) conducted 490 hours of raptor surveys in the counties of Rio Doce and Santa Cruz do Escalvado, situated in Rio Doce Valley, Minas Gerais, Brazil.

Located within the Atlantic Rainforest domain, the Rio Doce Valley was

originally part of a continuous and luxurious jungle whose range extended towards the Rio Paraíba do Sul Valley. However, today this region is characterized by the absence of pristine jungle, due mainly to coffee and sugarcane monocultures. The few remnant fragments are small and mostly disconnected from each other.

Forest patches, riparian forests, Pedra do Escalvado (the biggest monolith in the region), open areas and even the urban zones of both counties were studied by means of transects conducted on foot, by boat and car, as well as by point count techniques.

The results showed a significant replacement of typical forest raptors by species associated with open areas and high impacted environments, not just in number of taxonomic categories present, but mainly in nesting records, Bicolored Hawk, Collared Forest-falcon, Black Hawk Eagle and Black-and-White Hawk Eagle were recorded only once and were not seen displaying any breeding behavior. No nest of any typical forest species was recorded.

Among the species that take advantage of the edge effect, Short-tailed Hawk



NEOTROPICAL RESEARCH 2005

Luiz Salvador

Habitat fragmentation in the upper Rio Doce region

(one pair) and Laughing-falcon (two pairs) nested successfully in different forest fragments. Species that are opportunistic and highly tolerant to human activities made the majority of nesting attempts. Plumbeous Kite (8 pairs), Roadside Hawk (5 pairs), Yellow-headed Caracara (4 pairs), Crested Caracara (3 pairs), White-tailed Hawk (2 pairs), Aplomado Falcon (1 pair) and American Kestrel (1 pair) bred during the present study. When considering individual records, Black Vulture and both Daptriiidae were the most common raptors in the area.

The results of the present study show the importance of large areas of healthy habitat to the conservation of raptors associated with the forest canopy. The large forest eagle *Harpia harpyja* has been considered locally extinct for a long time, while other forest raptors like *Spizaetus ornatus*, *Accipiter poliogaster*, *Leucop-*

ternis polionotus, *L. lacernulatus* and *Falco deiroleucus* present serious conservation problems in upper Rio Doce region due to its deforestation and fragmentation. Although not registered, these species may be occasionally present in the study area.

Most of our knowledge about neotropical raptors is local, incomplete and was obtained in anecdotal ways. When we consider those species dependent on forest habitats, this situation becomes even more critical, since our knowledge about them is growing slower than their rate of extinction.

With the intent to protect typical forest raptors, we must obtain detailed information about adaptation, tolerance and vulnerability of these species in relation to disruption and fragmentation of their habitats, as well as to know their conservation status and

understand their distribution patterns in threatened regions not yet surveyed, like the Atlantic Rainforest of Southeast Brazil.

We hope this investigation completes some of these gaps in the upper Rio Doce Region, helping us to better understand the population dynamics of these endangered predators in areas with high human impact.

* * *



NEOTROPICAL RESEARCH 2005

Luiz Salvador

UHE Rizoleta Neves Reservoir— Rio Doce Valley

(ANDEAN CONDOR, NATURE AND CULTURE IN ECUADOR... FROM PG. 1)

ting, loss of habitat and poisonings were identified as the fundamental causes for the decline of this species in Ecuador. To learn more about this species' behavior, Meza-Saltos monitored a juvenile male that was reintroduced in Cajas National Park after spending some time in a rehabilitation facility. Using conventional telemetry, an ethogram was created, revealing the predominant activities condors engage in over time. In descending order, the condor spent its time perching, sleeping, flying, feeding, associating with other species, exercising its flight muscles, and associating with other individuals of the same species. At this time, Meza-Saltos also identified 1 roost site, 1 nest, and 7 condors in Cajas National Park and surrounding areas.

In 2003, thanks to those groups working for the conservation of this species, headed up by the Ministry of the Environment and including around 16 other mostly private institutions, the National Strategy for the Conservation of the Andean Condor was established. As part of the implementation of this strategy, the Society for the Investigation and Monitoring of Ecuadorian Biodiversity (SIMBIOE), in a joint effort with The Peregrine Fund, began carrying out a population census of Andean Condors in Ecuador in 2008. From 25 observation stations, situated at 2600 meters above sea level along the Ecuadorian Andes, they identified and counted individual condors using photo identification techniques. This will provide the most current data for this species and will help plan for the next steps to take to reduce the threats to this species.

Nature

Forty two percent of the world's moors are found in Ecuador, occupying around 5% of the country, although only 36% of these are found within protected areas.

Human presence in the moors began

more than 200 years ago, when poor indigenous and *mestizos* (mixed race) were displaced from the valleys into higher, less accessible zones, by church and colonial representatives. One hundred years later, the government took possession of these lands and converted them into large agricultural farms, some of which persist even to today. And finally, the agricultural reform of the 70's and 90's turned over part of the moors to communities and private landowners. Thus began the paradox: the increase of livestock on the moors – which became the principle food source for the Andean Condors, was also, at the same time, causing loss of habitat and increase in hunting and trafficking which decimated the population to the point of disappearing forever from Ecuador.

Today, some efforts are being made for the conservation of the moors mainly through tourism and environmental services. However, they have, until now, had very limited success.

To sustainably manage nature, in this case the moors, one needs research, education, and social appropriation for the conservation of the species and its habitat, as well as political will to create sustainable development alternatives for everyone involved, thereby promoting equality between them.

Andean Culture

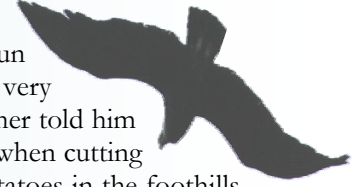
Historically, the Andean Condor was venerated in communities throughout the Andes region. In some of areas, it is still honored to this day. However, despite its cultural importance, the majority of townspeople along the Ecuadorian ridge persecute this species because of the belief that the condors hunt their cattle on a regular basis.

The story of condors hunting calves is a common tale told by men and women of varying ages, nationalities, social class and culture, throughout the



Investigation. Local field technicians monitoring an active condor nest in the moors of Volcán Quitlindaña

THE STORY OF THE CONDOR



Don Enrique Tasiguano, an elder Kitu Kara, says that as a boy he lived in a place called Atun Ninguna (Precipice of the Wolf). His father often told him about the condors that flew very close to their house, which was found in the parish of Hatun Pamba (Large Plains). His father told him that he knew the condors by the name – “wakklla” - which is the sound their wings make when cutting through the air. One day, the people of Hatun Pamba went to harvest corn, barley and potatoes in the foothills of the Pichinchas, known today as the city of Quito. On that very day, a condor carried away two children - Maritza and José Manuel- but not to eat them.

The potato gatherers saw those two children high up in the Pichincha. When the children were asked how the condor was treating them, they said that the condor was very sweet, noble and wise, and that while they flew on its back they saw the entire community below. As they flew, the condor said: “this is your land, these are your waters, these are your plants, these are your riches, which you must protect and honor. Don’t mis-use them or harm them. Don’t destroy the watersheds.” When the children were back in the heights of the Pichincha, where the first drops of water fell, the condor continued explaining to them: “I take this water and from here it goes through the glens so you can drink, eat and live well”. He also told them: “there are plants that cure, plants that feed, plants that can be used for building things, and plants that can destroy... take this into account and learn about all the things around you. There are good lands and bad lands, there are good people and bad people.”

Having said this, he dropped them into the nest of the condors, in the Kuntur Wachana. As the condor flew away, he told the children to walk toward the sunrise. The children walked until they found a group of mothers from the community that were digging potatoes in the eastern flank of the Ruco Pichincha. The children told them about what they learned from Taita Kuntur. The lesson the children learned from the condor was meant to help us to improve our lives, how we treat each other and our common knowledge.

Photo © Patricio Meza Saltos, Cónдор. Kuntur — adult male

Andean region. They say that condors attack the cattle in bands of three to five individuals, of which two or three – with very low flights and strong wing beats - scare off the calf’s mother and the rest of the herd. The remaining condors attack the young, landing on its back and biting its eyes and tongue (its soft parts) until the young calf bleeds to death, offering a great feast to the condors.

If this tale turns out to be proven true, it would show that even though they are scavengers, condors could hunt for food using “group cooperative hunting” strategies, a very sophisticated technique.

There are other stories about the condor that can be used as a pillar to help support our conservation strategies (*see The Story of the Condor*).

Dissemination

In spite of the fact that the Andean Condor is a national symbol, very few people know anything more about this species other than from the drawing that appears on the shield on our flag. Through the Kuntur Project, we hope to increase the knowledge, on a general level, about the Andean Condor, so that it becomes better known within our society. On the 6th and 7th of July, 2008, the Friends of the Condor -Colectivo Ciudadano Amigos y Amigas del Cónдор y la Tierra (ACT) along with SIMBIOE and the support of other local individuals and organizations, organized the largest festival dedicated to a wild threatened species ever held in the country: The National Day of the Condor. The festival, held in Quito, included artistic/cultural activities with many of the arts represented such as: dance, theater, puppet shows and music, among others. We held a round-table discussion on “Condors, Nature and Andean Culture” to discuss the protection of nature and of our culture. Attendance was incredibly

high. Over 300 collaborators helped to make this day a success and over 5,000 people participated and enjoyed our celebration of this sacred bird. This activity helped to begin a process of communication, consciousness raising and sensitization about the importance of the condor, the ecosystems on which it relies, and the cultural bond that exists between this species and the society of our nation.

* * *

Harpy Eagle Conservation and Research Program: Objectives and Perspectives

by José de Jesús Vargas González,
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The Harpy Eagle (*Harpia harpyja*) is a threatened species that inhabits lowland forests in the Neotropics, including those forests that have been altered by humans. This, of course, affects the eagle's survival in both the short and long run. In spite of this species' flexibility or adaptability to altered environments, we have determined that it does have specific requirements in the microhabitat it uses as a nesting site. The reproductive territory required by this species varies considerably. Work by many researchers suggests the range is between 14 and 70 km² per pair, approximately. As a result, the conservation of Harpy Eagle populations should include the protection of large tracts of forest with sufficient connectivity.

Reports on the status of Harpy Eagles in Central and South America suggest that the populations have been declining over the past decades, and if the threats they face today continue, they will likely become extinct in a relatively short amount of time. The main long or mid-term threat to the persistence of this species is deforestation and fragmentation of their habitat. Their most immediate threat is human persecution, mainly by poachers. It is evident that developing plans for management and sustainable actions to reduce the human impact on Harpy Eagle habitat needs urgent attention.

In order to be efficient and effective in the conservation process, it is necessary to have a solid scientific background about the bio-ecology, habitat requirements and local threats to this raptor. For that reason, in 2000, The Peregrine Fund and Fondo Peregrino-Panamá initiated the Harpy Eagle Conservation and Research Program in the Pacific region of the Darien Province, Panama (Map 1).

The general goal of the program is to conserve the Harpy Eagle and its habi-

tat through a combination of: environmental education, participation and empowerment of the local communities; and scientific investigation to form and answer biological hypothesis. The initial results of the past eight years of continuous research have caused us to modify our objectives as the program evolves in a positive way, as well as reaffirm, reinforce, and design new methods of data collection to obtain the best results. This will help us amplify our "human" perspective about the requirements for the Harpy Eagle.

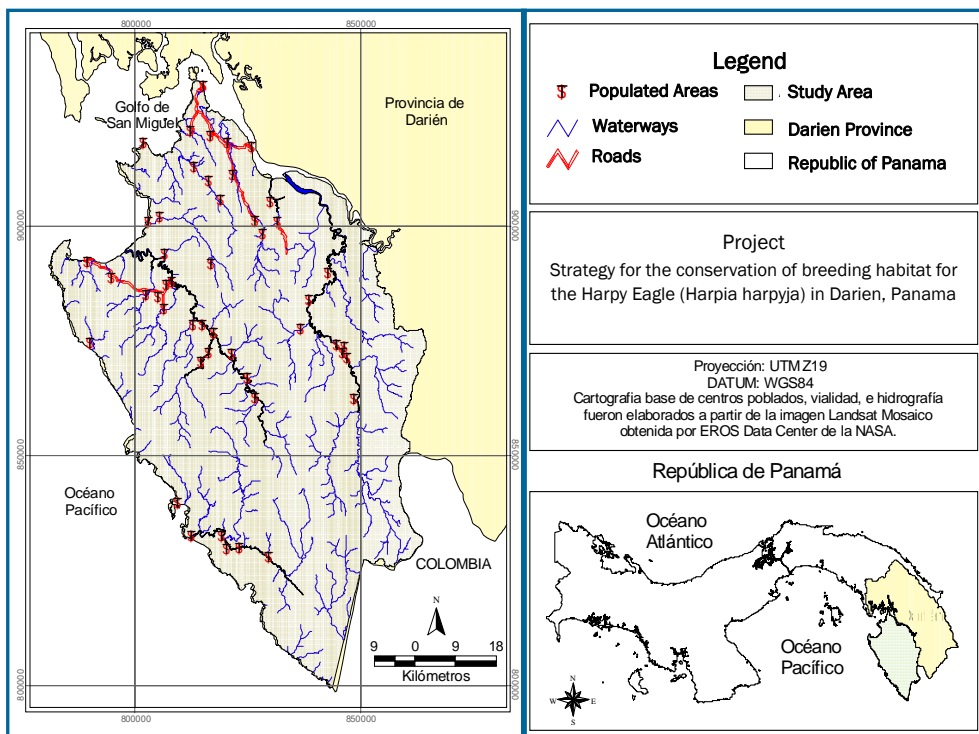
The principle objectives of the program are:

1. Offer environmental education talks to children and adults;
2. Train members of the local communities in basic aspects of conservation and research;
3. Estimate the survival rate, dispersion and habitat use of adults and juveniles in habitat with different levels of human alteration;
4. Locate and monitor the productivity of known nests;
5. Describe the reproductive micro-habitat;
6. Determine the availability of prey species in different levels of human-altered landscape;
7. Disseminate

the results through conferences, technical reports, radio messages, and popular and scientific articles, to offer tools to help make decisions that contribute to the conservation of this species.

During the first two years of research, we identified potential areas for study, and we formalized our relationship with local communities through cooperative agreements. With the signing of these agreements, we were assured that the program's activities in the areas of research, conservation, local training, environmental education, and community participation would be successful. We consider local participation to be relevant and key to the sustainability of conservation plans in the mid and long term.

The intrinsic characteristics of the Harpy Eagle (longevity, density, and reproductive strategy, among others) make long-term study of this species essential, in order to obtain an ade-



Map 1. Location of study area, Darién, Panamá.

quate sample. For example, the monitoring of the nests indicates that the Harpy Eagle can nest successfully in altered forests with different degrees of anthropogenic impact. However, we don't yet know if the Harpy Eagles will continue to breed in these same areas in the long term. For this reason, it is important to continue monitoring over many years to collect sufficient demographic data.

The main results of the past six years are: 1. The completion of a Master's thesis focused on the ecology and reproductive habitat of the Harpy Eagle; 2. Two scientific publications on the status of its conservation and interaction with other raptors; 3. Sixteen presentations given in scientific conferences in Central and South America; 4. Increase in the participation and empowerment of local communities through the training of 41 field technicians, who have supported our conservation and ecological monitoring efforts; 5. Development of environmental education campaigns focusing on the conservation of Harpy Eagles, other raptors and their ecosystems; 6.

Established a long-term strategy for the ecological monitoring of the Harpy Eagle population; 7. Presented reports to Panama's National Environmental Authority, and the Traditional Embera and Wounann Authorities, which contributed to decision-making efforts and environmental policy in the region.

This experience has served to enrich the knowledge of program participants, and has allowed us to better visualize the local threats that the Harpy Eagle population and the ecosystems in Darien face. For example, the environmental education campaign has reduced the hunting of this species, but it has done little to stop the destruction of habitat. The lack of employment opportunities, coupled with the struggle to meet basic needs (food, education, among others) plays a big part in the communities' actions and decisions regarding the land and their use of the local flora and fauna. This socio-economic need and the current environmental issues have caused us to gain new perspectives and incorporate other components to reduce the negative effects on the ecosystem used by the Harpy Eagle. Involving other entities, such as the environmental authority and other govern-

(Continued on page 10)

WHY WORK WITH THE HARPY EAGLE?

Conservation – It is a globally threatened species dependent on management and conservation. The ecosystems which it inhabits are some of the most impacted by anthropogenic activities.

Scientific – There is a lack of information about the bioecology of this species, including mortality rate, behavior, movement patterns, habitat use, and reproductive success, among others.

Ecology – As a top predator, and due to its habitat requirements, the Harpy Eagle is considered to be a flagship and an umbrella species for the conservation of tropical forests. Efforts to protect this species can help increase interest, awareness and empowerment in local communities regarding environmental issues.

Bio-cultural – The cultural value of many species, both for indigenous groups and in modern society (dance, music, crafts, national birds, etc.) has been underestimated in many conservation plans. The Harpy Eagle is an emblematic species that has been used as a symbol of strength, agility, beauty and nature from pre-Colombian times to the present, by different indigenous groups in Central and South America. This cultural importance offers many advantages for the conservation of this species and its habitat.



Photos © José de J. Vargas González



Research Activities

(HARPY EAGLE CONSERVATION PROGRAM... FROM PAGE 9)

Photos © José de J. Vargas González



Environmental Education in Embera and Wounaan communities

mental and non-governmental organizations is the strategy to be followed in the next years. It is a difficult task, but one that merits attention and effort.

In regards to the methods of investigation, we have applied and incorporated traditional observation techniques for the collection of qualitative and quantitative data on behavior, description of habitat, and prey census, among others. We have also incorporated the use of radio transmitters to monitor individual adults and juveniles, as well as the utilization of Geographic Information Systems to identify variables, and determine spatial requirements and movement patterns, to design models of suitable habitat, and to characterize the habitat.

Our goal is to carry out long-term research to contribute more scientific data necessary to make environmental decisions, to fill in the gaps in information, to consolidate and establish new initiatives for conservation in other regions, design applicable methods with this species and other birds of prey, and strengthen the knowledge and experience of students and local scientists. We also want to continue increasing the local capacity through training, and continue identifying problems while working in conjunction with local communities, look for solutions that offer tangible results. In conclusion, the results and goals that were met allow us to qualify this program as a success, create new goals that promise new challenges, more experience and better results for the conservation of the Harpy Eagle and its habitat.

Acknowledgements

We thank donors to The Peregrine Fund's Harpy Eagle Project, in particular Wolf Creek Charitable Foundation, Liz Claiborne and Art Ortenberg Foundation, USAID, Disney Wildlife Conservation Fund, and others. To the field technicians and volunteers that represent the heart of this conservation program. To the Embera and Wounaan communities, and to the Congreso General y Regional de Tierras Colectivas Embera y Wounaan, for their collaboration and logistical support. To the National Environmental Authority of Panama, for permits and support with digital material of the study area. Special thanks to Marta Curti and the Neotropical Raptor Network for contributing to the divulgation of the results of the program.

* * *

Helping to Conserve the Harpy Eagle through Environmental Education in Darién, Panama

by Saskia Santamaría, The Peregrine Fund, Neotropical Environmental Education Program, ssantamaria@fondoperegrino.org

Before deforestation and poaching caused a decline in their populations, the natural range of the Harpy Eagle extended from southern Mexico to northern Argentina. However, many of the countries within that range have not had a registered sighting of this species in many years, particularly in Central America. The main exception to this is Panama where a healthy wild population still exists. Today, Panama is considered the last main refuge of the species in Central America.

Of the nine provinces and different indigenous reserves (called *comarcas*) in which the Panamanian territory is divided, the province of Darién is the most important



K. Herrera explaining the importance of healthy habitat for migrating birds

in terms of Harpy Eagle conservation. This province, located in the eastern part of the country and bordering with Colombia, is the home of the Darien National Park and Biosphere Reserve, among other protected areas. This is why The Peregrine Fund-Panama has focused its Harpy Eagle Conservation Program and part of its Neotropical Environmental Education Program (NEEP) efforts in this province. The main objective of this program is to help positively change human attitudes toward raptors and to stress the importance of conserving raptors in nature. In this specific case, it is important for communities to understand the importance and long-term value of conserving healthy Harpy Eagle populations.

In Darien this has proven to be an interesting challenge because of the large mixture of different cultures, each with a very distinctive way of life, found there. Darien is home to: indigenous groups such as the Embera, Wounaan and Kunas; peasant farmers that have emigrated from other provinces; and groups of Afro Caribbean descendants. The Neotropical Envi-

ronmental Program has worked in several of the communities, especially in Embera and Wounaan indigenous communities since it is on these lands where the most Harpy Eagle nests have been recorded.

To work successfully with a variety of different groups and cultures, NEEP utilizes educational talks, games and hands-on activities about raptors, the Harpy Eagle, the importance of raptors in the food chain, and bird migration, among other topics. We provide relevant factual information so that community members can then make their own decisions, whether as a community or on an individual basis, about the use of their natural resources. Evaluating the program is key to measure the program's results and, modify the educational methods when necessary.

One of the communities where positive results have been seen is Mogue, and Embera/Wounaan community. Partly due to The Peregrine Fund-Panama's work there and partly because of the involvement of other organizations, several members from the community have come to appreciate the long term value of conserving the Harpy Eagle. They often host visitors from other areas and bring them to observe the species in its natural environment. This benefits the com-

munity and highlights the positive impact Harpy Eagle conservation can have.

Even though not everything has been positive in this community (for example it came to our attention that a community member had burned part of a forested area where at least one individual had been sighted, not to mention other local fauna), it is still a satisfaction to witness how educating children and adults has planted the seed for Harpy Eagle conservation. It is our hope to keep reaching communities with our talks so that other positive actions and attitudes surface, helping to conserve more Harpy Eagles in nature.

Acknowledgments

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* * *



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Students in Darien playing "Flying, Flying, Flying," a game that simulates raptor migration



**Neotropical
Raptor
Network**

Fondo Peregrino - Panamá
www.peregrinefund.org
www.fondoperegrino.org

We're on-line!
www.neotropicalraptors.org

The NRN is a membership-based organization. Its goal is to aid the research and conservation of Neotropical raptors by promoting communication and collaboration among biologists, ornithologists, raptor enthusiasts, and other conservationists working in the Neotropics.

To join the NRN please send an email to mcurti@fondoperegrino.org, introducing yourself and stating your interest in Neotropical raptor research and conservation.

CONFERENCES AND MEETINGS

3RD NEOTROPICAL RAPTOR CONFERENCE October 28-30, 2009 Bogotá, Colombia: Please stay tuned for more upcoming information through the Neotropical Raptor Network! www.neotropicalraptors.org

THE ORGANIZATION FOR TROPICAL STUDIES AND THE UNIVERSITY OF COSTA RICA announce the Tropical Ecology and Conservation course, Jan 14—Feb 23, 2009. For more information visit contact or visit academic@ots.ac.cr
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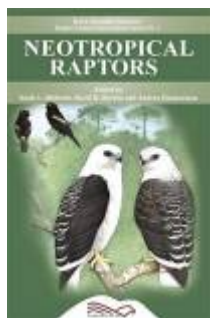
25th INTERNATIONAL ORNITHOLOGICAL CONGRESS August 22-28, 2010. Campos do Jordao, Sao Paolo, Brazil. For more information visit <http://www.ib.usp.br/25ioc/>

NEW BOOKS AND THESES

1. Vargas-González J. de J. 2008. Strategy to conserve the breeding habitat of the Harpy Eagle (*Harpia harpyja*) in the Darien Region, Panama. Master in Science Thesis. Universidad Experimental de los Llanos Occidentales "Ezequiel Zamora", UNELLEZ.

This thesis has four chapters: 1. Microhabitat preferences; 2. Spatial evaluation of the forest cover in three periods; 3. Suitability model of breeding habitat; 4. Conservation strategy.

2. **NEOTROPICAL RAPTOR**, 2nd Neotropical Raptor Conference Proceedings, Iguazú, Argentina, June 2006



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