# Conversations from the Field

# By Markus Jais & Yenifer Hernandez



**Markus Jais:** How many raptors species currently inhabit Colombia? And which is the least studied species?

**Santiago Zuluaga:** Currently, we know of 77 species that inhabit Colombia. It is the country with the greatest raptor species diversity in the world. Red-tailed Hawk (*Buteo jamaicensis*) is a species that was recently registered, it is not reported in the Book "Aves rapaces diurnas de Colombia" (Marquez et al. 2005). According to the authors by lack of physical evidence to support this finding, however, it specie has been recorded mainly in the northern (San Andres, Providencia, and Santa Catalina) and western (Antioquia) regions of the country.

Having high species richness in Colombia is a defining factor when carrying out studies in order to learn about the biology and ecology of these species, since we have many species but most exist at very low abundances.

Regarding the least studied species, I could say that half of the species we have can be classified in this category. There have been very few researchers interested in studying raptors, so our knowledge of most species is very limited.

If we consider the species with real possibilities of being studied in the country, and those that are in risk of extinction, I consider that Black-and-chestnut Eagle (*Spizaetus isidori*) is the least studied species... I hope that this changes in the next years, since we are beginning to learn about the different aspects of its biology, ecology, and interaction with the communities, under the PAC-Colombia framework, and from the studies carried out by C. Márquez, H. Delgado, F.A. Gutiérrez and M. Pinzón in Boyacá.

#### MJ: What are the main threats for raptors conservation in Colombia?

**SZ:** Raptors in Colombia are being threatened mainly because of direct hunting, hunting of their natural prey, habitat transformation, and illegal trafficking; factors that feedback on one another, leading to reductions in its populations, which in some cases are already greatly reduced.

For species of small size, like Plumbeous Forest-falcon (*Micrastur plumbeus*), Semicollared Hawk (*Accipiter collaris*) and Cinereous Harrier (*Circus cinereus*), habitat transformation is without a doubt the greatest threat. Also, we know very little of their biology and requirements, making it difficult to implement conservation measures or plans.

Great species, like Black-and-chestnut Eagle, Ornate Hawk-eagle (*Spizaetus ornatus*), Harpy Eagle (*Harpia harpyja*), Black Solitary Eagle (*Buteogallus solitaries*) and Crested Eagle (*Morphnus guiaensis*), are being threatened mainly because of direct hunting, hunting of their natural prey, habitat transformation, and, in some cases, illegal trafficking. These species are little known and no long term projects had been developed to study them until now with the development of PAC-Colombia.

The Andean Condor (*Vultur gryphus*) is a species in a very critical situation in Colombia, due to three main factors: 1) the wild mammals on which it has historically fed on are currently very scarce, such that its diet depends on a high percentage of domestic mammals; 2) carrion poisoning, as a measure to control livestock predators such as the puma (*Puma concolor*) and feral dogs, leads to the death of Andean condor individuals due to intoxication; and 3) hunting or capture of condors for illegal tenancy or because they are considered responsible for the death of newborn domestic animals (cattle).

#### **MJ:** Are the government and local communities interested in raptor conservation?

**SZ:** Yes, but only some charismatic or umbrella species have had this fortune. For example, the Andean Condor is a national symbol and for many years important resources have been invested in this species, as well as support from the government and different local communities as part of the National Program for the Conservation of the Andean Condor in Colombia.

For the Harpy Eagle, there have also been important resources invested for the reintroduction of an Eagle couple in the north of the country; however, although this project counted on State support and interest from the communities, it was terminated

before reaching the most important achievements.

In the last years, the different government entities have invested important technical and financial resources for the conservation of the Black-and-chestnut Eagle, under the framework of the Proyecto Águila Crestada-Colombia (PAC-C). Through an alliance between the "Corporación Autónoma Regional del Guavio" (government entity), the "Fundación para el Manejo y Conservación de los Ecosistemas Neotropicales" (non-government organization), and support from leaders of the "Grupo Campesino para la conservación del Águila Crestada, AGUILEROS" (from farmer communities of the Guavio region), the installation of the first GPS/GSM transmitter on a juvenile Crested Eagle was achieved, an unprecedented event in the country, of which I hope to discuss later.



#### MJ: Is bush-meat hunting a problem for raptor conservation in Colombia?

**SZ:** Bush-meat hunting is a great problem for raptor conservation in Colombia. The hunting of wild animals for food is a major problem for the conservation of large raptors in Colombia. This practice reduces the populations of mammals and birds, of medium and large size, potential prey Eagles how Black-and-chestnut Eagle, Crested Eagle and Harpy Eagle. In this situation, some of these species are being forced to search feed on farms and agricultural land where hunt domestic animals, situation than which in turn contributes to conflict between these species and local communities.

Furthermore, the loss of large-sized wild mammals in the high and medium mountains is considered one of the causes of the population decline of Andean Condor.

Additionally, we have some records of this type of practice in indigenous communities in southeastern Choco that may occasionally hunt Swallow-tailed Kite (*Elanoides forficatus yetapa*) individuals for consumption. Although it is necessary to study this situation in order to gain a better understanding, I consider that the impact on resident populations of this species is minimum, unlike that which occurs with great eagle species that are hunted because they are considered a threat to domestic animals, or the hunting of migrating hawks (*Buteo platypterus* and *Buteo swansonii*) in other parts of the country.

# **MJ:** Why and when was the PAC-C "Proyecto Águila Crestada-Colombia" (or Black-and-chestnut Eagle Research Project – Colombia) started?

SZ: PAC-C was born in the year 2008 when a group of 15 Biology and Veterinary Medicine students of the Universidad de Caldas decided to work on a proposal for conserving the Black-and-chestnut Eagle, driven by a vocation of promoting the conservation of this species. The initial work proposal included three components: in situ, ex situ, and environmental education, with subgroups of five students working on each component. Several years passed and since it was difficult to find economic resources to begin the work, most students graduated and found jobs in areas different from raptor conservation. I never lost hope in obtaining resources for beginning the field activities and I continued visiting private and government entities, until in April of 2012, the Peregrine Fund, through its program Education in Latin America, granted me economical support to observer the feeding habits and reproductive biology of two nests located in the Eastern Andes mountain range of Colombia. From this first field work, PAC-C began its work. Currently, we concluded our second year of field work and we have signed several alliances with government and private institutions that have acted for the conservation of this species. Together with these institutions and with support from the rural communities, we are strongly working to gain a better understanding of its biology and ecology, and to mitigate hunting threats.

# **MJ:** What is known about the population size and trend of the Black-and-chestnut Eagle in Colombia?

**SZ:** The newest version of the Libro Rojo de Aves de Colombia (Renjifo *et al.* 2014) has estimated that the Black-and-chestnut Eagle population is between 320 and 640 individuals, located in a potential habitat of 16007.4 Km<sup>2</sup>. These values suggest that most of the species' total population is found in Colombia, as was also proposed by the researcher Federico Carlos Lehmann in the 50's, when he suggested that the species was more abundant in Colombia than in the other countries of the region.

It is evident that its population is decreasing, so it is necessary to carry out field work throughout its distribution, since the estimation of its population was done based on ecological niche models and habitat remnants. Considering that hunting is affecting juvenile recruitment in the population, these values could be overestimating the species' actual population size.



**MJ:** What do the Black-and-chestnut Eagles eat in Colombia?

**SZ:** From anecdotic observations by different researchers, we know that the species feeds on squirrels (*Sciurus*), churucos (*Lagothris lagotricha*), monkeys (*Cebus* sp.), coatíes (*Nasuella* sp. and *Nasua* sp.), sloths (*Bradipus* sp. and *Choloepus* sp.), pavas (*Chamaepetes* sp. and *Penelope* sp.), paujiles (*Crax* sp.), guacharacas (*Ortalis* sp.), and domestic poultry (*Gallus gallus*).

In the framework of the PAC-C, we have conducted 680 hours of systematic observations for two nests belonging to the same Eagle couple. From these data, we have found that the most frequent prey is the squirrel (*Sciurus granatencis*), while domestic poultry (*Gallus gallus*) contributes the most biomass. Other species recorded during these observations are *Penelope montagnii*, *Nasuella olivácea*, *Lagothrix lagotricha*, and *Dasypus novencintus*. From other methodologies, like camera traps and collection of nest remains, we have found remains from other raptor species of lesser size how Yellow-headed Caracara (*Milvago chimachima*), which has led us to question if the species is acting as a super-predator that controls meso-predators.

MJ: What is the preferred habitat and nesting tree species of the Black-and-chestnut Eagle in Colombia?

SZ: The preferred habitat of the Black-and-chestnut Eagle in Colombia is native forests

with high precipitation, located at altitudes between 1500 and 3000 meters. However, these zones present high deforestation, since the big cities in the country are located at this altitudinal range; an estimated 80% of the Colombian population is established in this zone.

The altitude range in which the species' nest has been found is between 1700 and 2100 meters. In the last decade, we have known about three Black-and-chestnut Eagle nests in Colombia, two of these were located in emerging trees of the genus *Vochysia*, and the third was in an emerging tree of the genus *Ficus* for which we measured different structural parameters. It has a diameter at breast height (DHB) of 306 cm, a height of 48 m, and is located on a slope of 32.5°.

#### MJ: Is there conflict with livestock owners, e.g. chicken farmers?

**SZ**: Yes, there is conflict, since perceptions of the area's inhabitants show a situation of nature-man conflict. There is an ambiguous relationship between acceptance towards the eagle and concern for the economic consequences that this species' hunting habits represent to the inhabitants' economic activity, mainly domestic poultry raising.

#### **MJ:** What are the main difficulties studying the Black-and-chestnut Eagle?

**SZ**: The areas where we are studying the Black-and-chestnut Eagle in Colombia are difficult locations to access, far from cities, and with extremely difficult environmental and topographic conditions, all of which represent serious logistic challenges when monitoring the species. Besides, it is not easy to find active nests of this species and, although we suspect possible nests and places where there is a strong conflict between the eagle and man, many times it is very challenging to obtain economic resources to carry out investigations.

#### MJ: Are you using GPS transmitters and what have they contributed so far?

**SZ:** Recently, we installed a GPS/GSM transmitter on a juvenile Black-and-chestnut Eagle individual. This is the first time in Colombia that an Eagle chick is captured in the wild to be marked with a transmitter, and that GPS/GSM technology, never before used in the country, is put to the test.

We are very satisfied with the results we have obtained until now, because we are determining that juveniles are highly dependent on native forests, while transformed areas, such as livestock pastures and forest-pasture ecotones, are used at a very low percentage.

During the previous reproductive cycle (2014), we field-monitored a chick since its birth until nine months of age, and although we obtained very interesting results, the efforts invested in the field were very high, obtaining approximately 900 GPS points. On the other hand, we are obtaining data from a juvenile marked with a transmitter since March 30<sup>th</sup> of 2015, gathering approximately 120 GPS points a month. At the moment, we are obtaining the most important data, because the chick is leaving its parents' territory in search of establishing in its own territory. We are very much looking forward to working with farmer communities where the individual moves in order to mitigate hunting

threats and offer development opportunities to the communities.

Some specifications of the equipment used, as well as measures of the chick are:

#### CHICK "Lluvia"

Weight: 1500 g Wing span: 91 cm Height: 56 cm Tarsus width: 6 cm Age: 40-45 days Ring code: A1

#### TRANSMITTER

Brand: ECOTONE TELEMETRY Model: DUCK-H Weight: 30 grams (2% the chick's weight) Interval: GPS position every 3 hours / SMS every 12 hours



#### MJ: Where should future research and conservation efforts be directed?

**SZ**: Our future research efforts are directed to monitoring Black-and-chestnut Eagle juveniles and adults through telemetry, monitoring the species' feeding habits, monitoring and conserving the species' wild prey, obtaining information on its reproductive biology, and investigating the man-Eagle conflict. Through this, we aim to determine its dispersion and home range, such that we can estimate more accurately its habitat requirements, prey community status, population density, juvenile survival, and the impacts of the community hunting this species.

Regarding conservation strategies, we are aiming at generating capacities in the rural communities, so they can obtain alternative income sources, different from domestic animal raising, such that the impact generated by the Black-and-chestnut Eagle can be compensated through tourism focused on the species. This would represent a win-win situation where the communities and the species would benefit. Also, we consider it of great importance to establish protected areas in historical nesting zones of the species, in order to limit land use and mitigate the expansion of the agricultural frontier in these areas.

PAC-C was born from the need to carry out conservation actions for the Black-andchestnut Eagle, but we are also working with the Andean Condor, and hope to contribute in the next years to the conservation of the Harpy Eagle, Solitary Eagle, Crested Eagle, Ornate Hawk-Eagle, among other raptors in risk of extinction in Colombia. For this, we are going to begin receiving donations from different people and entities that have manifested their interest to this cause, and we are going to present project bulletins beginning in January of the year 2016.



### MJ: What needs to be done to secure the future of the Black-and-chestnut Eagle in Colombia?

**SZ:** To secure the future of the Black-and-chestnut Eagle it is necessary to consider four aspects: as a first measure, increase the scarce knowledge of its biology and ecology and measure tolerance levels of the man-Eagle conflict; second, establish environmental education programs directed to children, teenagers, and adults in relation to the importance of conserving the species and its environment for mankind's own welfare; third, build protected areas in the nesting sites and possible species' dispersion areas; and last, generate economic income sources related directly or indirectly with the species, in a win-win situation where both parties in the conflict can benefit.

# **MJ:** What is known about the status of the Harpy Eagle in Colombia?

**SZ:** I consider that the knowledge we have of the Harpy Eagle in Colombia is very limited and scarce. Apart from the project previously mentioned, in which two exemplars were intended to be reintroduced in the north of the country (department of Cordoba), there has been no other field effort to study its biology or evaluate its conservation status. Based on what I have learned of the species' biology in the Amazonian forest from studies done by researchers of the Projeito Gaviao-real, I consider that there must be an important number of nests of this species in the Colombian Amazons. Also, there is recent evidence of hunting in the departments of Caqueta, Guaviare, and Casanare, although no researchers or institutions have led a long term project with this species, so its current status is little known.

### **MJ:** What is known about the status of the other three Hawk-Eagles (Spizaetus)?

**SZ**: Considering that the status of the other three Hawk-Eagles has not been evaluated in the country, these are most likely in a very similar situation to the Harpy Eagle, although I can say the following:

The Ornate Hawk-Eagle is a species with a historically similar distribution to the Harpy Eagle in the country. The Ornate Hawk-Eagle's requirements allow this species to be found in environments with little transformation, below 1000-1200 m of altitude. Despite that some studies in other countries suggest its diet is mainly based on birds, it does not frequently hunt domestic species, possibly because it is very sensitive to human presence. In the year 2001, it was thought that the species *S. ornatus vicarius*, that inhabits the inland and the Pacific coast, had suffered a considerable decrease as a consequence of deforestation and hunting. Based on this, it is placed in the Vulnerable category, however, its conservation status has not been recently evaluated in Colombia.

The Black Hawk-Eagle is a species that can inhabit open and moderately transformed areas. It is possible that the high percentage of loss of the original dry forest extension in Colombia is affecting its populations. Its conservation status has not been recently evaluated in Colombia, yet, it is considered to be a widely distributed species in the country.

The Black and white Hawk Eagle is one of the most rare and least known Eagles in the country. There are very few records of the species, and in 2001, it was classified as Vulnerable, although its conservation status has also not been recently evaluated in

Colombia.

**MJ**: *How do you see the future of raptors in general and the Black-and-Chestnut Eagle in Colombia?* **SZ**: The future of raptor study and conservation in Colombia poses great opportunities and challenges for biologists, ecologists, and other professionals interested in these important birds. Among the great raptors, I consider that we have a great opportunity to study three species, which are very representative of different ecosystems and could act as umbrella species to support the conservation of a great number of other species, including raptors as well as fauna and flora in general. These are the following:

Andean Condor: although its populations in the country were strongly affected in the 80's, it is a raptor species that has received the most human and economic investment for its conservation. It is a species that inhabits mainly high altitude zones between 2500 and 5000 m, so it is located in an ecosystem of vital importance for guaranteeing water supply to the cities, as well as other ecosystem services of vital importance to the country's development. By working continuously on the processes that are being carried out on environmental education and research, this species could recover in the future from its precarious population status.

Black-and-chestnut Eagle: it is typically considered a Colombian species with an important population in the country compared to other countries of the region, and currently, there are actions being made for its conservation. As long as we achieve efforts to mitigate hunting in areas of the country where this species presents a negative interaction with the communities and continue studying its biology, it is possible that the status of its populations may become stable. Yet, if we do not count on greater support from the media and communications, who have begun to show interest for these topics, it will be very complicated to get conservation messages across to every place in the country where this species and others are being hunted.

Harpy Eagle: it has been poorly studied... We know that there is an important population of this species in the south of the country, however, the future of this species is considered to be uncertain until we have the capacity to study its populations in the south of the country. As I mentioned earlier, surely, in the Colombian Amazons there is a well conserved population of this species, waiting for a raptor biologist to study it.

#### MJ: Is there collaboration with other countries and NGOs?

**SZ**: The Projecto Águila Crestada-Colombia has grown so much in the last years that we consider necessary to establish it as an independent NGO. As of now, the Fundación PAC-C will continue leading the project during the next 10 years, with support from the Fundación NEOTROPICAL, CORPOGUAVIO, and The Peregrine Fund, among other institutions who are interested in supporting the species' conservation.

We have established joint work streams with the Centro para el Estudio y Conservación de Aves Rapaces en Argentina (CECARA), in order to gain feedback on the work we have done with the species, considering the low sample size that we have and the importance of implementing transitional conservation measures for the conservation of the species.

We are also permanently collaborating and communicating with researchers of the Projeito Gaviao-real at the Instituto Nacional de Pesquisa Amazónica (INPA) of Brazil, from whom we have learned a great deal and continuously gain feedback on field experiences and research focuses.

## MJ: What was your favorite experience with raptors in Colombia?

**SZ**: My favorite experience in the study of raptors in Colombia was the capture and marking of a Black-and-chestnut Eagle chick. We had been planning this for two years and we counted on the economic and technical support from CORPOGUAVIO and NEOTROPICAL. The manufacturers of the ECOTONE TELEMETRY transmitter were very generous and patient, and the INPA researchers trained us for the ascent to the nests. The experience happened the following way:

The mission began in the late hours of the afternoon when the team, integrated by biologists and people from the community, arrived to the area where the nest was located. We installed ropes, reviewed the work plan, and set out to capture the chick. After reaching the nest, it was captured and I carefully brought it down to the ground, where the rest of the team members were waiting ready to measure, weigh, mark, and install the transmitter. When everything was ready, I brought the chick back up to the nest, leaving it there carefully, at 2:30am on March 31<sup>st</sup> of 2015.

I hope to be able to repeat this experience many more times and, in this way, contribute my grain of sand to the conservation of this important species and other species, mainly the great raptors with which we hope to begin work soon.