

PROJECT CHICAMOCHA

The conservation of two Critically Endangered dry forest birds;
Niceforo's Wren and Chestnut-bellied Hummingbird

Investigation



Conservation



Education



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FINAL REPORT

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2. Project Chicamocha

Niceforo's wren and Chestnut-bellied hummingbird are both Critically Endangered species, endemic to the dry valleys of the Eastern Cordillera of Colombia. Although extremely poorly known, their current distributions are likely to be highly restricted and their remaining forest habitats are under intense anthropogenic pressure. In order to develop an urgently needed and effective conservation strategy for these two species, this student initiative aims to establish their current status through: accurate determination of their distributions; identification of their principal habitat and resource requirements; clear delineation of current threats; and the collection of relevant data in order to clarify both species taxonomic status.

Our team of student fieldworkers has determined the major threats to these species and their habitats and what people know about them through informal interviews. Quantitative surveys (line transects, mist-netting, plot grid) has been undertaken to assess population dynamics and where possible individuals have been caught using mist nets for marking and collecting relevant data to assess species taxonomic status. Detailed ecological studies (habitat characterization, breeding biology, diet and movements) have been carried out at two study areas. Also, during fieldwork, data on other bird species have been collected to identify Important Bird Areas.

This project has produced vital information on the population status and distribution of these two species, as well as conservation activities and environmental education has aimed to awake the ecological awareness in the local community.

3. STATUS, DISTRIBUTION AND HABITAT REQUIREMENTS OF CHESTNUT-BELLIED HUMMINGBIRD (*Amazilia castaneiventris*) IN THE CHICAMOCHA VALLEY, COLOMBIA.



A. INTRODUCTION

The Chestnut-bellied Hummingbird (*Amazilia castaneiventris*) is an endemic species from the Chicamocha Valley in the east Andes of Colombia (Hilty & Brown 1986). This species is Critically Endangered because it has an extremely small known range and its suitable habitat is severely fragmented and is declining at the moment (IUCN Red List 2004). This species is restricted to the departments of Santander and Boyacá where had been recorded only a few times (BirdLife 2004, Renjifo *et al.* 2002). Nevertheless one specimen was collected in 1947 on the east slope of the Serranía of San Lucas in the department of Bolívar (Collar *et al.* 1992). There is no information on status and population changes of this species, but it is believed that population estimate is 250 – 999 individuals (BirdLife 2004). Lopez and Lanus (2002) suggest that the Chestnut-bellied Hummingbird possible habitat could be 330 km².

Our study was conducted in the Chicamocha Valley system. This supports large human populations and has large areas of high agricultural production. Natural habitat has been severely fragmented, and generally replaced by coffee plantations, light woodland and, to a lesser extent, pastures and plantain, and sugarcane plantations. Semi-arid habitats are threatened by livestock-grazing and seasonal burning for farming (BirdLife 2004, Renjifo *et al.* 2002). These threats have affected the population of *A. castaneiventris* during many decades and there have not been studies to determine its status, natural history and habitat preference. For these reasons, our aim was to assess the current status of *A. castaneiventris* according to three objectives: (1) to map the current distribution along of the Chicamocha Valley; (2) to identify important aspects of natural history; and (3) to describe their habitat characteristics.

B. STUDY SITE AND METHODS

The Chestnut-bellied hummingbird has been reported for the dry Valleys of Fonce, Suarez and Chicamocha rivers in Boyacá and Santander provinces in Colombia (Rengifo *et al.*, 2002) (Fig 1). Two exploration teams conducted fieldwork in this area to map the current distribution along of the Chicamocha Valley from 8 July to 15 December 2004, during the local dry (June – August) and rain (August – December) seasons. Initially, work was based around Soatá, Boyacá (6°16'57,3" N 72°38'53,1" W), and San Gil, Santander (4° 59'S 152° 07' E). When individuals of *A. castaneiventris* was found during explorations both teams collected important field data on the status of this threatened species and on the major anthropogenic pressures that put them or their habitats at risk.

The field behavior observations reported were made at Finca Lagunetas (Zapatoca, Santander) and at La Jabonera (Soatá, Boyacá). The vocalizations and behaviors were recorded and observed in the morning (6:00 - 10:00 hours) at the territories of three males of Chestnut-bellied Hummingbirds. Vocalizations were recorded with Sony WMD6C tape recorder and Sennheiser ME66 microphone. We digitalized and analyzed every recorded song using Canary (Charif *et al.* 1995).

Ecological requirements along the dry forests of the Chicamocha river basin:

We traced one plot of 5m² were we saw individuals of Chestnut-bellied hummingbird (13 plots). We used an 8 cm diameter cylinder with a grid to measure the following habitat features:

- Percentage of leaf litter

Choosing five random points, we placed the cylinder perpendicular to the ground at 1.5 meters high. We calculated the percentage of leaf litter comparing the number of squares covered by litter vs. not covered, and then averaging the five random plots results.

- Percentage of canopy cover.

Choosing five random points, we placed the cylinder perpendicular to canopy. We calculated the percentage of canopy cover comparing the number of squares covered by leaves and tree branches vs. not covered, and then averaging the five random plots results.

- Basal tree area

We measured the girths (GBH) of the trees within each plot to calculate the percentage of basal area occupied by trees.

- Vegetation cover

The vegetation cover was measured at five different levels using the method described by Montes (1998) and adapted by Noon (1981). We used a 30 cm x 4m cloth with 10 x 10 cm black and white squares, with five levels categories: 0 to 0.5m, 0.5 to 1m, 1 to 2m, 2 to 3m. The cloth was placed perpendicular to the ground in the middle of the plot. From 10 meters distance we counted the number of squares covered by vegetation in each level from four different points (North, South, East and West), using binoculars.

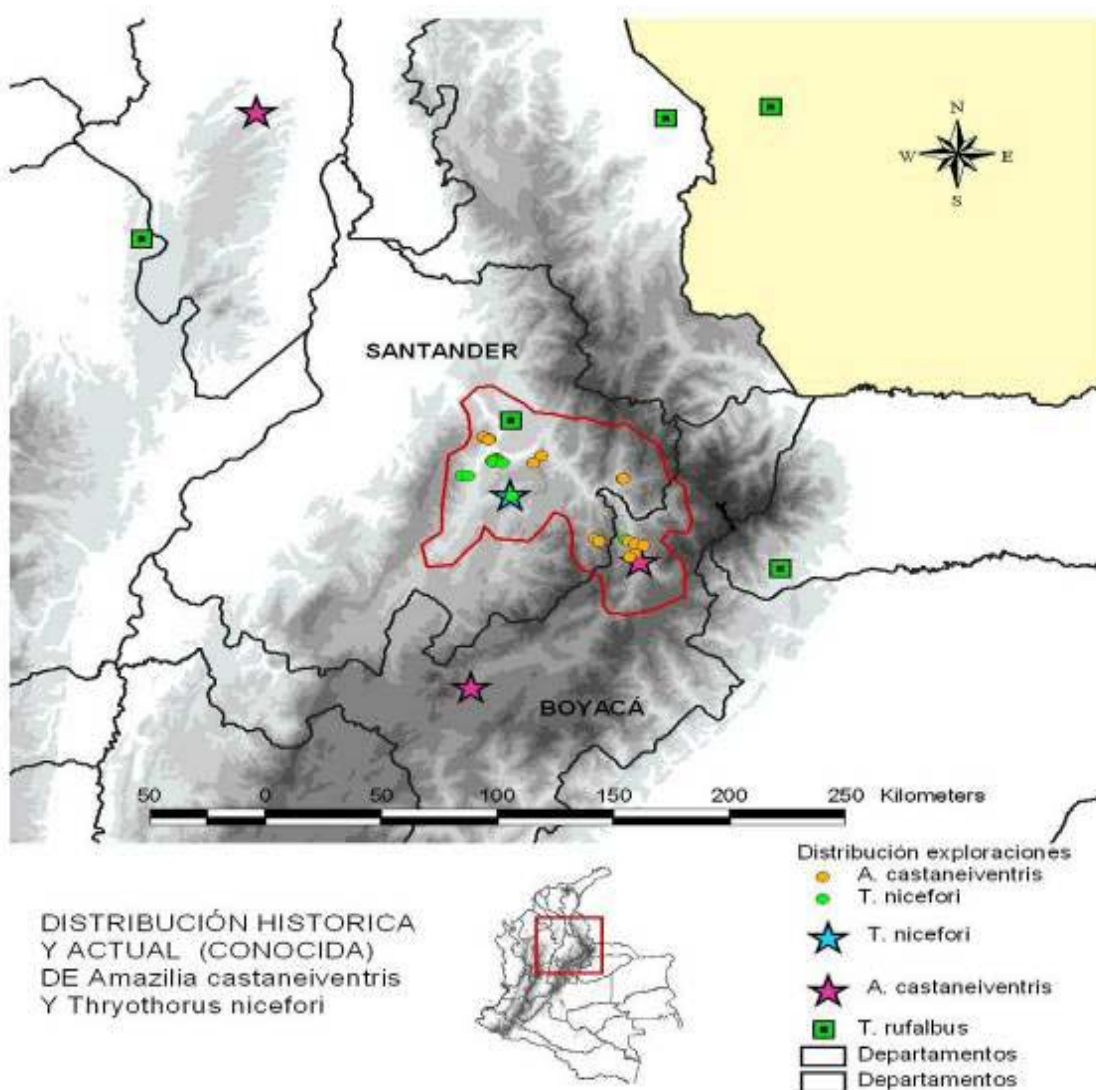


Figure 1. Study site and exploration map of Project Chicamocha

C. RESULTS

i). Map the current distribution along of the Chicamocha Valley

Chestnut-bellied hummingbird was recorded along the Chicamocha Valley in Boyacá and Santander provinces (Fig. 1). The Chicamocha team explored 18 places in 12 municipalities. *A. castaneiventris* was found in 8 localities along Chicamocha and Sogamoso river's basins (Fig. 2). The highest altitudinal record was at 2,100 m in Soata, and the lowest altitudinal record was at 730 m in Finca Lagunetas, (Zapatoca, Santander). The largest group recorded was 8 birds recorded early one morning in agricultural field with trees of *Thricantera gigantea* with flowers in a place called Jabonera near to Soatá. Hummingbirds were mainly recorded near to plants with flowers of cactus (*Opuntia sp.*), and trees of Yatago (*Thricantera gigantea*).

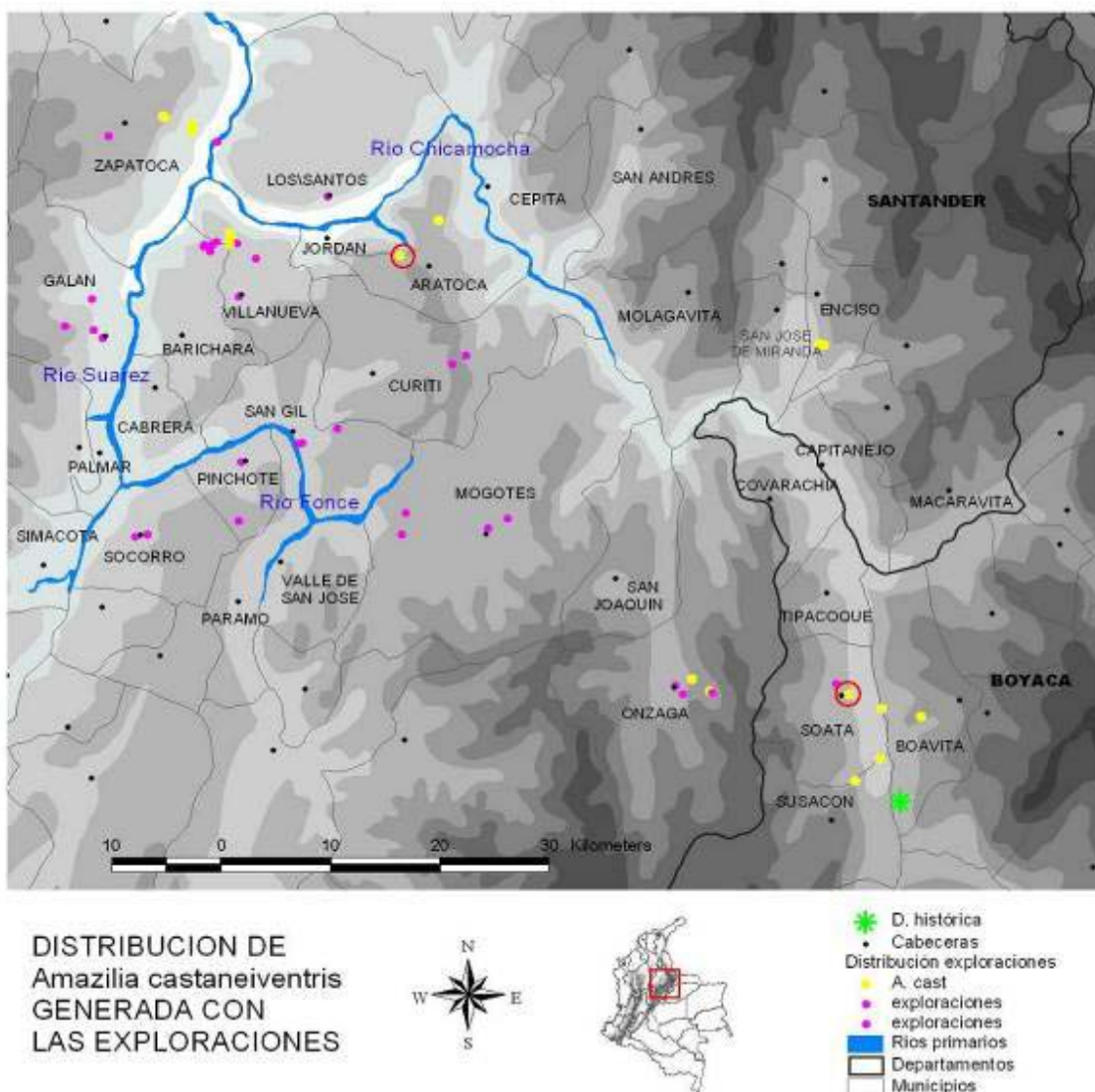


Figure 2. Chestnut-bellied Hummingbird new records of distribution in Chicamocha valley.

ii) Aspects of Natural History

Population density

During a three month period censuses were carried out at the vereda La Costa where we found a population density of 3 individuals every ha. Females were more common than males and the density numbers were correlated with the flowering trees present at the time.

Foraging Behavior

In the Vereda La Costa, the flower species visited by the Chestnut-bellied hummingbird were mainly open and edge shrub species. Nearly all the flowers visited were red and in less amount yellow and blue. The flower species visited by the Chestnut-bellied hummingbird belong to the following families: Acanthaceae, Cactaceae, Malvaceae, Lamiaceae, Mimosaceae, Fabaceae, and Solanaceae. However the most visited plant species were *Trichanthera gigantea*, *Erithryna* sp, *Hibiscus rosa-sinensis*, *Inga codonatha* and *Salvia* sp. (table 9), that probably are the most important nectar feeding resource for the hummingbird. Chestnut-bellied hummingbird individuals usually choose to feed on flowers located on the outer parts of the plant, this is probably because flowers at the outer part of the plant are easier to reach than inner flowers. In each feeding bout Chestnut-bellied hummingbird visit six to nine flowers, having sometimes a resting perching periods.

We also observed Chestnut-bellied hummingbird individuals feeding on insects trapped in spider webs. This webs were usually found in the branches of Naranjo (*Citrus* sp.), Gallinero (*Pithecolobium dulce*) and *Opuntia depauperata* plants.

Territorial behavior

We observed a clear defensive and territorial behavior by Chestnut-bellied hummingbird on areas where we found abundant flowering trees of *Trichanthera gigantea* and other plant species. *T. gigantea* shows a remarkably abundant flowering periods causing a high individuals visit frequencies.

Intraespecific interactions were the most frequently pattern observed in Chestnut-bellied hummingbird individuals. Individuals showed an aggressive behavior and defended its flowers feeding resources from other individuals. On the other hand Chestnut-bellied hummingbird was observed interacting aggressively with other hummingbird species like *Amazilia cyanifrons*, *Colibri coruscans*, *Campylopterus falcatus* and *Chlorostilbon poortmann* and in a lesser extent with other bird species like *Coereba flaveola* and *Vermivora peregrina*.

Vocalizations

- Aggressive Chatter

As other hummingbirds, the aggressive chatter (Fig. 3 A, B) is a rapid series of grating notes “brz-tzip-tzip-tzip-tzip” given in high-intensity aggressive interactions. It consists of an introductory note undifferentiated with a wide frequency range, from about 1.11 kHz down to 12.37 kHz. It has a frequency peak of 9.47 kHz, and last 0.0657 seconds. Next notes are similar in frequency range (1.35 kHz - 10.3 kHz), frequency peak (9.82 kHz), and duration (0.0322 seconds). Number of notes is between 5 and 10 and aggressive chatter duration is 0.368 seconds. The aggressive chatter is directed towards other *A. castaneiventris* or other hummingbirds. A Chestnut-bellied hummingbird aggressive chatters either as it attacks or chases another hummingbird, or as a warning that the vocalizer is about to leave its perch and attack. Chatters are given by territorial males, as another hummingbird approaches the territory.

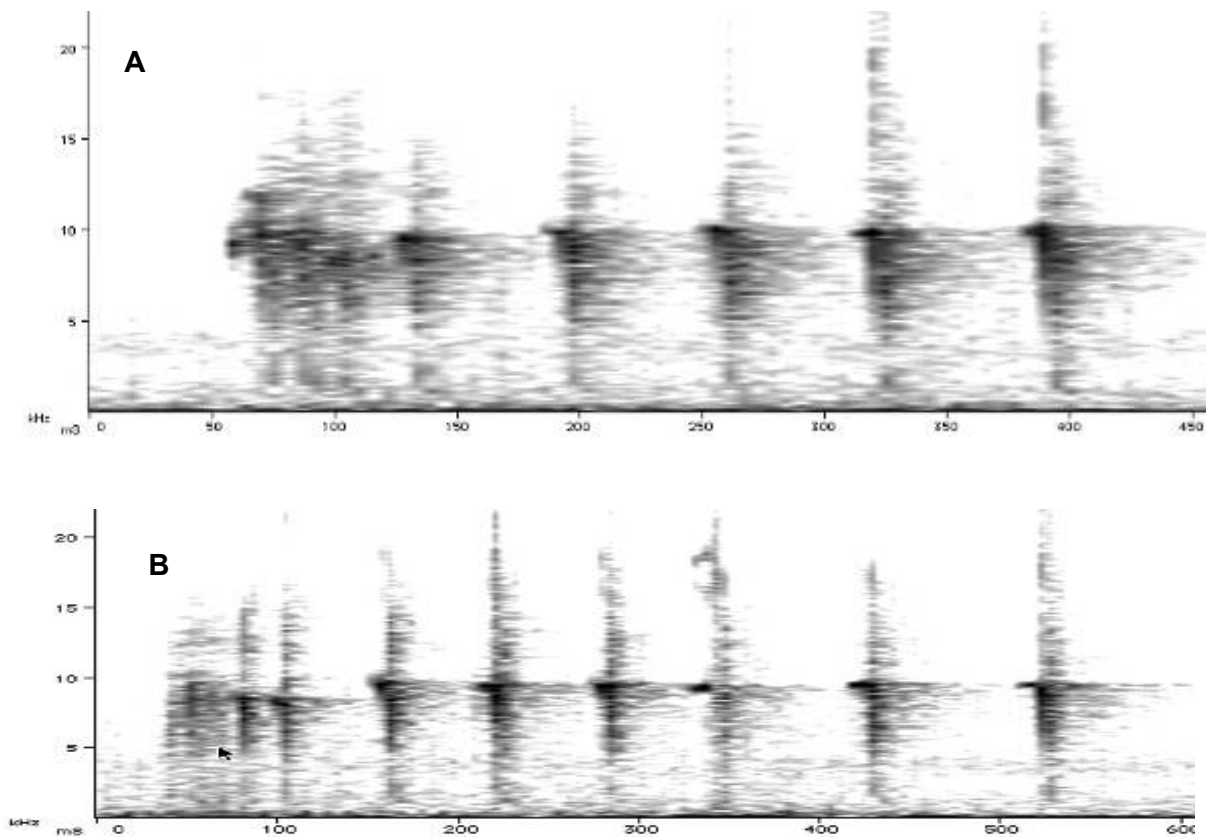


Figure 3. Aggressive Chatter call of Chestnut-bellied Hummingbird recorded at La Jabonera, Soatá, Prov. Boyacá, Colombia.

- Feeding Call

Feeding call is a rapid series of buzzy notes “gre” given when hummingbird visits a flower to feed. It consists of a several buzzy notes undifferentiated with a wide frequency range, form about 0.810 kHz down to 16.89 kHz. It has a frequency peak of 7.15 kHz, and last 0.0645 seconds (Fig. 4).

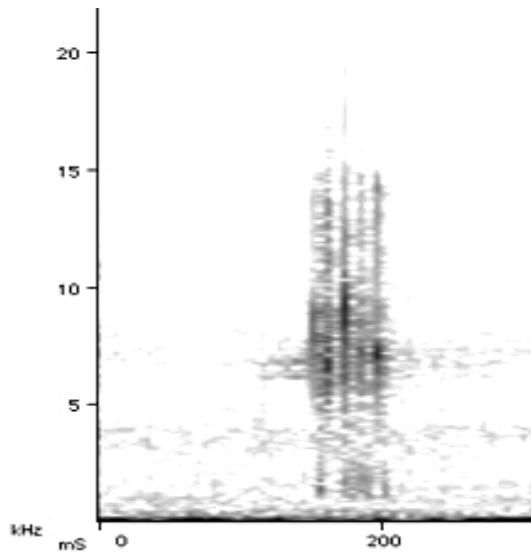


Figure 4. Feeding call of *Amazilia castaneiventris* recorded at La Jabonera, Soatá (Boyacá, Colombia).

- Chatter

Chatter is a series of buzzy notes “grr-grr” given when hummingbird finished a territorial attack to other *A. castaneiventris* or other hummingbirds. It consists of a several buzzy notes low in frequency peak (1.85 kHz), with a wide frequency range, from about 0.880 kHz down to 11.2 kHz. It has duration of 0.488 seconds (Fig. 5).

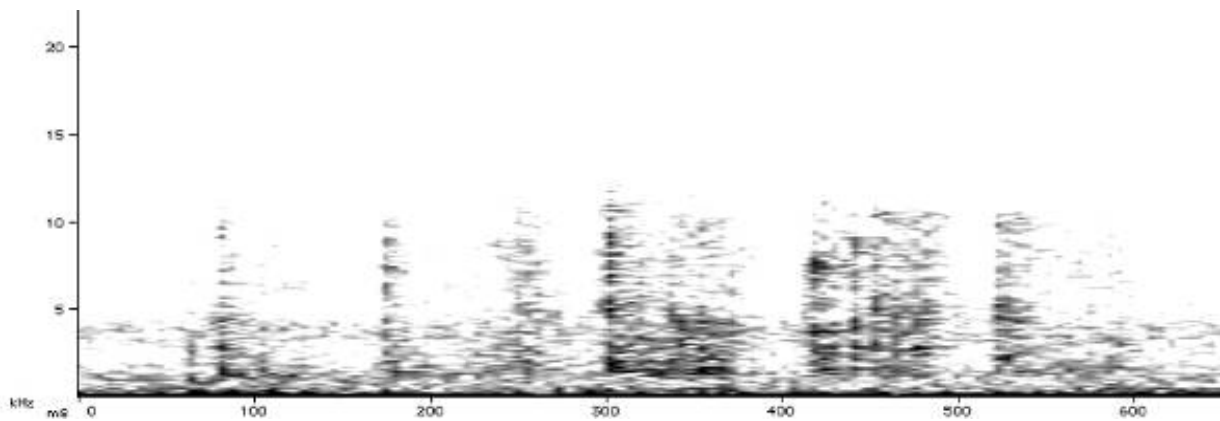


Figure 5. Chatter call of *Amazilia castaneiventris* recorded at La Jabonera, Soatá, Prov. Boyacá, Colombia.

- Song

Song consists of three different notes “zwe-zwii-chwee” given when hummingbird is perched in its territory (Fig. 6 A). Song can be to attract females or a territorial song to other males. The “zwe” note or introductory note can be repeated after “chwee” note “zwe-zwii-chwee-zwe” (Fig. 6 B). Also, the “zwii” note and “chwee” note can be repeated “zwe-zwii-chwee-

zwii-chwee" (Fig. 6 C). Introductory note "zwe" consists of wide frequency range, from about 5.26 kHz down to 8.45 kHz. It has a frequency peak of 5.79 kHz, and last 0.284 seconds. The frequency range of the second note "zwii" is similar, 5.49 kHz to 7.43 kHz. It has a frequency peak of 6.08 kHz, and last 0.181 seconds. Final note "chwee" has a low frequency, from about 1.49 kHz down to 3.02 kHz. It has a frequency peak of 2.04 kHz, and last 0.168 seconds. Several songs are separated by brief pauses of 1.237 seconds or less

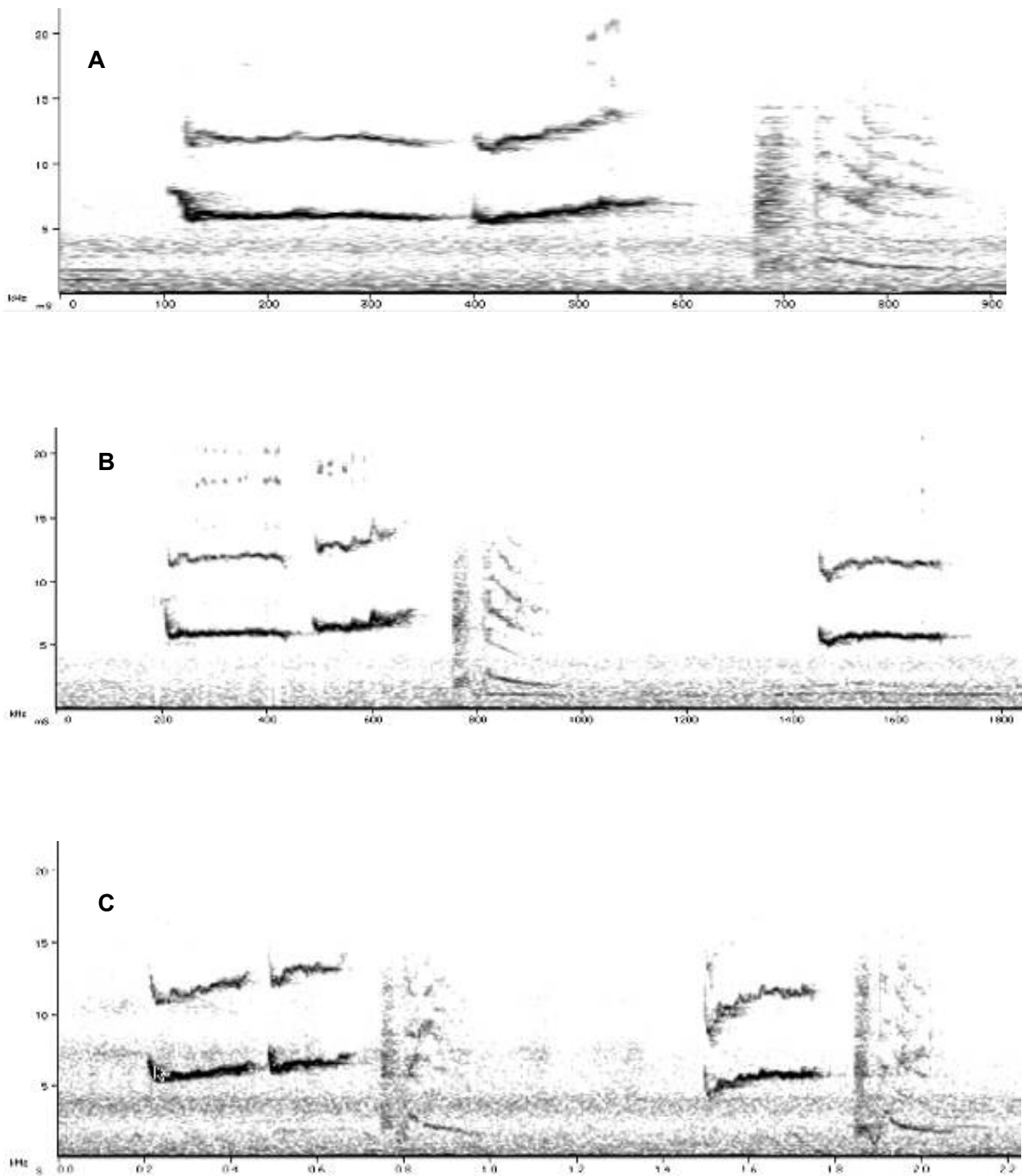


Figure 6. Song of Chestnut-bellied Hummingbird recorded at La Jabonera, Soatá (Boyacá, Colombia).

First nest description

During the field work period, we documented the nest of the Critically Endangered Chestnut-bellied Hummingbird. We found one nest in the municipality of Jordan, Santander (vereda el guásimo) and another three nests were found in the municipality of Soata, Boyacá (vereda Molinos and vereda La costa). These “typical” hummingbird nests were cup woven constructed with natural fibers (e.g. hairs, dead plant fibers, spiders webs) and lichens placed on the outside as camouflage (Figure 7 A, B). The height of construction varied among the nest. The first nest was located at a height of 11.5 meters and constructed by one individual (apparently the female). We also recorded the nesting of one Chestnut-bellied Hummingbird female on a *Sapindus saponaria* (Sapindaceae) plant. The nest was found at 45 centimeters above the ground. The nest had a height of 41.17 mm, a 20 mm interior diameter and 15.98 mm depth. The nest was green colored that probable help for camouflage with the vegetation (Fig. 7 D). Inside the nest we observed two white bean shaped eggs (Fig. 7 C).

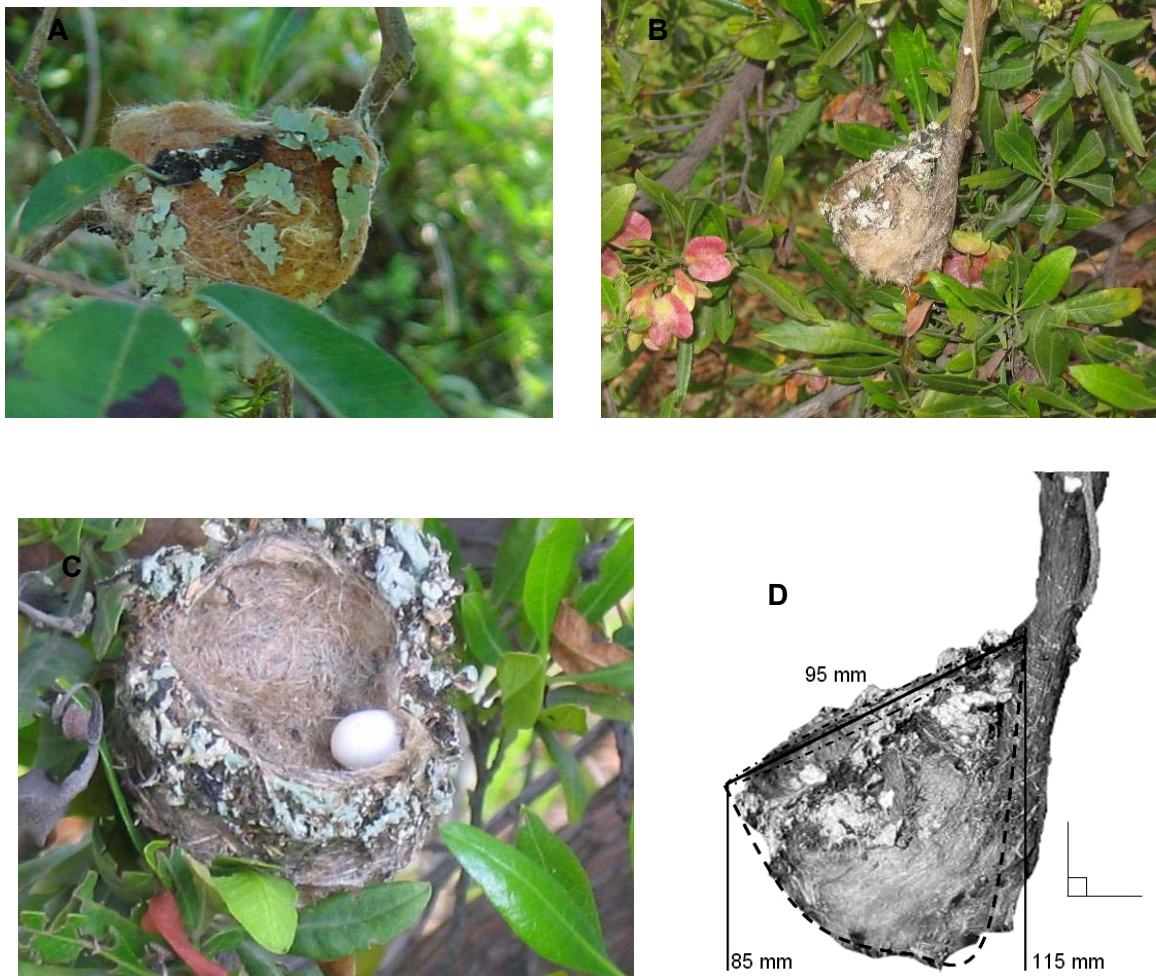


Figure 7. Chestnut-bellied hummingbird nest found A, B y C. Figure D shows the measures of one of the nests found.

iii. Habitat characterization

- Elevation.

Last reports suggest that this species occurs between 120 and 2200 masl (BirdLife International, 2004). In the explorations performed along the Chicamocha river basin, *Amazilia castaneiventris* individuals were observed between 1032 and 2011 meters above the sea level.

- Habitat characteristics.

Chestnut-bellied hummingbird was found in habitats from well conserved sites to human intervened sites. Chestnut-bellied hummingbird was found near cultivated areas, mostly fruit crops (*Citrus sp*, *Anona sp*) and shadow coffee plantations. Individuals were observed feeding on Guamo (*Inga sp*), Banana (*Musa sp*), Coffee and Yatago (*Trychanthera gigantea*) flowers. It seems that Chestnut-bellied hummingbird prefer areas very closed to rivers and streams (less than 100m). Also Chestnut-bellied hummingbird was found in thorn scrub and xerofitic bushes, where feed primarily on cactus flowers (*Opuntia sp*) (Fig. 9).

- Habitat structure.

The percentage of leaf litter was 41.55, the percentage of canopy cover was 70.81%, and the percentage of basal tree area was 4.07% (Table 1). The percentage of vegetation cover was always bigger than 20%, and we found the higher vegetation cover in the 0 to 0.5 m level (Fig. 8).

Table 1. Habitat structure. Data were registered in all 5 m² plots.

Features	Mean ± SD^a	Range (%)
% of leaf litter-	41.55 ± 23.61	4 - 79.70
% of canopy cover	70.81 ± 21.77	0 - 92.90
% of tree occupied area	4.07 ± 4.01	0.2 - 14.91
% leaf volume 0-0.5m	82.28 ± 15.04	50 - 100
% leaf volume 0.5-1m	69.46 ± 22.60	25 - 100
% leaf volume 1-2m	68.81 ± 24.20	20 - 96.30
% leaf volume 2-3m	69.90 ± 23.70	18.8 - 98.80
% leaf volume 3-4m	68.80 ± 22.90	23.8 - 100

SD= standard deviation.

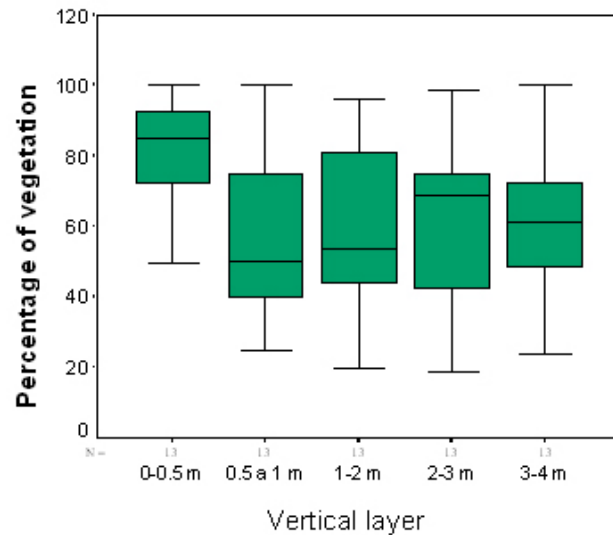


Figure 8. Percentage of vegetation cover where *Amazilia castaneiventris* was observed. Data were registered in 13.5 m² plots. In each location we analyzed five vertical levels.

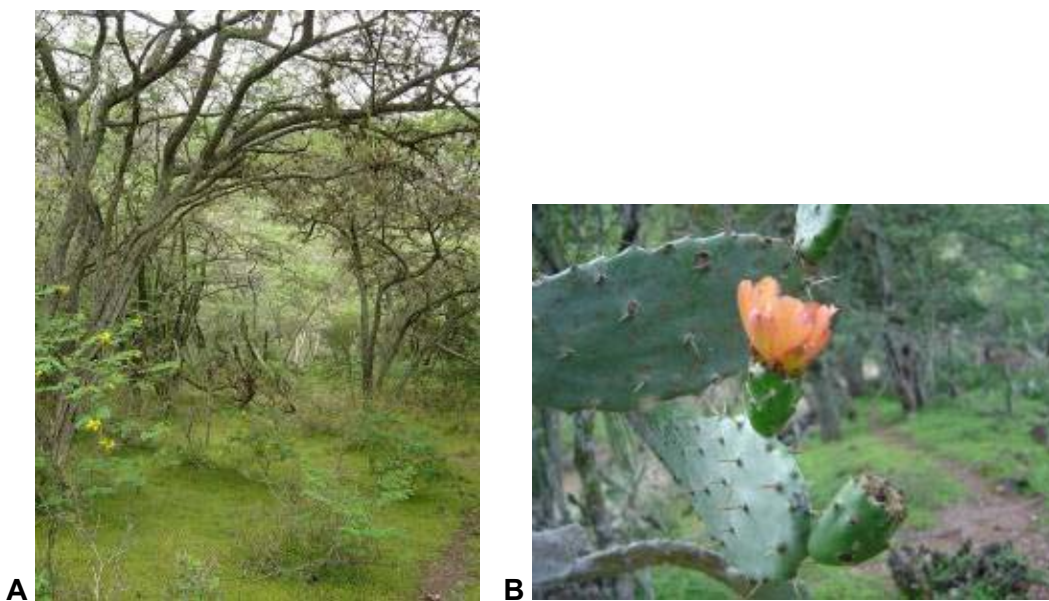


Figure 9. A. Thorn scrub habitat. B. *Opuntia* sp, flower resource for Chestnut-bellied hummingbird.

D. Discussion

Natural history

Chestnut-bellied Hummingbird has a large repertoire of vocalizations. Each vocalizations have a function, but the principal functions are territoriality, defending parch of flowers, and to attract female. In conclusion, the matting system is polygamy in this specie. The vocalizations of *A. castaneiventris* have similarities to vocalizations of *A. tzcatl*, but there are differences in the song. The most similar vocalization is aggressive chatter, but this vocalization is similar in other hummingbird in the genera as *A. cyanifrons*. *A. cyanifrons*

song is more similar to *A. castaneiventris* song. These species of genera *Amazilia* are sympatric in many of the localities visited in the Chicamocha area and differences of vocalizations were not noticeable in the field.

Ecological requirements and habitat use.

We reported 12 new records for Chestnut-bellied hummingbird, increasing its knowing range distribution along the Chicamocha Valley, including Suarez and Fonce river. The area where we found Chestnut-bellied hummingbird presents several habitat fragmentation and natural habitat has been replaced by light woodland, pastures and coffee plantations. Nevertheless Chestnut-bellied hummingbird exploits different kind of floral resources suggesting its tolerance to human activities. Though, rivers and stream seem an important habitat requirement. The great variation observed in ecological requirements where we found individuals of Chestnut-bellied hummingbird (Table 1) supports the idea that this species is able to exploit different resources, suggesting that flower resources availability could be a stronger requirement. In consequence, it is important to evaluate intraspecific competition for habitat resources.



4. Status, Distribution, and Habitat Requirements of Niceforo's Wren (*Thryothorus nicefori*) in the Chicamocha Valley, Colombia.



A. Introduction

Niceforo's Wren *Thryothorus nicefori* is endemic to the Chicamocha Valley of Colombia in the east Andes (Hilty & Brown 1986). This species has been known from just one site in a region where the environment is highly modified and habitat degradation is apparently continuing. Its known population is tiny and inferred to be declining, and its range is extremely small. This combination of factors leads to classification as Critically Endangered (BirdLife 2004, Renjifo *et al.* 2002). Validity as a separate species is doubtful. Vocalises like, and responds to recordings of the widespread *T. rufalbus* and could be a well-marked subspecies (BirdLife 2004). *T. nicefori* has been to occur on the west slope of the East Andes in Santander, Colombia. The only known site is the type-locality at San Gil on the río Fonce south of Bucaramanga, where ten specimens were collected between 1944 and 1948. There were no further records until two birds were observed and recorded in 1989, and then again in 2000 (BirdLife 2004, Renjifo *et al.* 2002).

Our study was conducted in the Chicamocha Valley system. It support large human populations and has long areas of high agricultural production. Natural habitat has been severely fragmented, and generally replaced by coffee plantations, light woodland and, to a

lesser extent, pastures and plantain, and sugarcane plantations. (BirdLife 2004, Renjifo *et al.* 2002). Suitable habitat may have been lost during this agricultural conversion and there are not studies to determine its taxonomic status, population size, distribution, natural history and habitat preference.

For these reasons, our aim was to assess the current status of *T. nicefori* according to three objectives: (1) to map the current distribution along of the Chicamocha Valley; (2) to identify important aspects of natural history; (3) to describe their habitat characteristics.

B. Methods

Current distribution along of the Chicamocha Valley.

The Niceforo's Wren has been reported only in the dry Valley of Fonce river in Santander (Colombia) (Rengifo *et al.*, 2002) (Fig. 1). To map the current distribution of this species two exploration teams conducted fieldwork from July 8th to December 15th (2004). The exploration were carried out during the dry (June – August) and rain (August – December) seasons along the Chicamocha Valley.

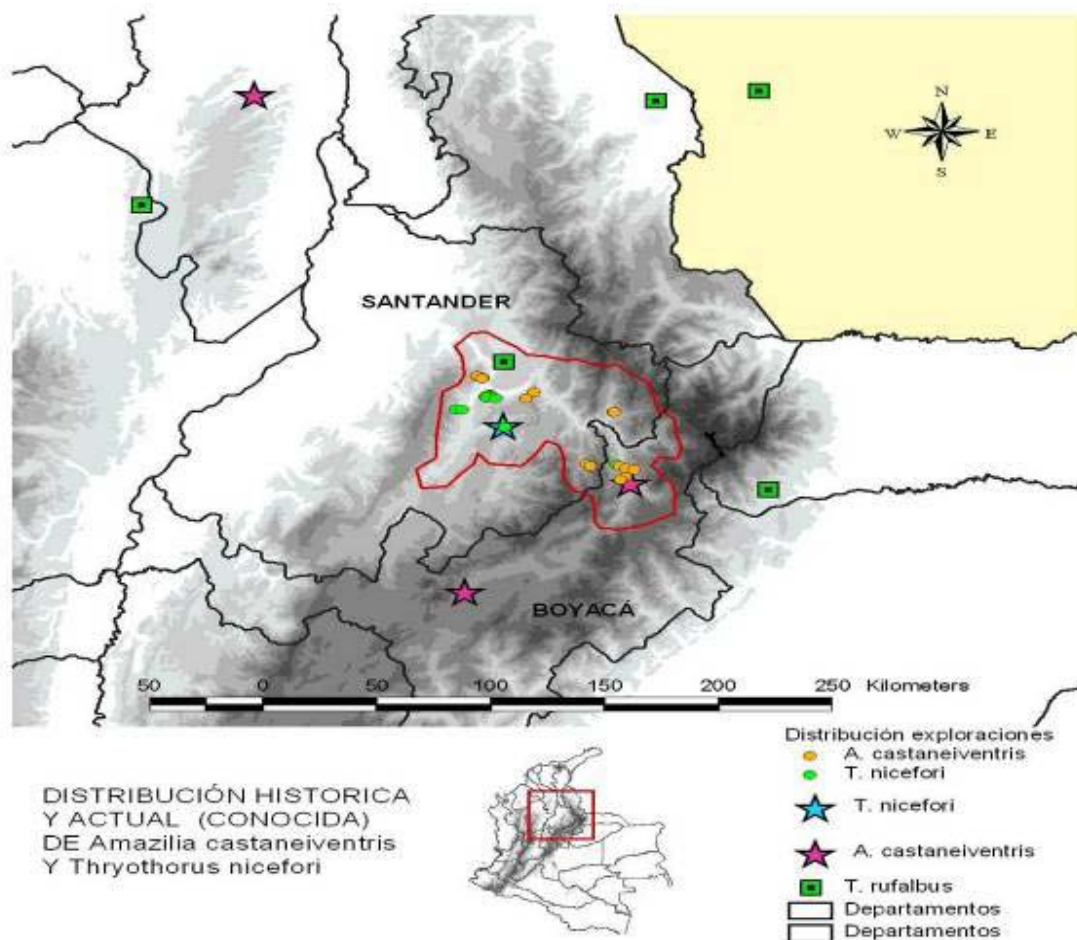


Figure 1. Study site and exploration map of Project Chicamocha.

Natural History

Initial work was carried around San Gil, Santander ($5^{\circ}13' S$ $152^{\circ} 02' E$), and Soatá, Boyacá ($4^{\circ} 59'S$ $152^{\circ} 07' E$). Where individuals of Niceforo's Wren were found research teams collected important field data on the status of this threatened species populations and on major anthropogenic pressures that put them or their habitats at risk, anyplace an individual of *T. nicefori* was found during explorations.

During the initial fieldwork observations on behavior were made at San Gil, Villa Nueva, and Galán (Santander). The vocalizations and behaviors were recorded and observed in the morning (6:00 - 10:00 hours) at the territories of three couples of Niceforo's Wren. Vocalizations were recorded with Sony WMD6C tape recorder and Sennheiser ME66 microphone. We digitized and analyzed every recorded song using Canary (Charif et al. 1995).

During a second period a specific research work on natural history was conducted. This study was carried out in two forest fragments called Bella Isla and Gallineral. Both forest fragments are located in the San Gil city (Department of Santander) ($6^{\circ}32' N$, $73^{\circ}14' W$) and are near the Fonce river and Curiti stream (Figure 2), in the Chicamocha valley. The average annual precipitation is of 1319.5 mm, showing a unimodal rainfall regime, with a rainy season between May and October and a dry seasons between December and February (Data IDEAM in PBOT –Gobernación municipio de San Gil 2004).



Figure 2. Study area map.

Other data was recorded on Macaregua (06°39'37" N, 073°06'33" W) at 1575 meters above the sea level (Vereda San Francisco, municipio of Curití, Santander). This site is located in the Chicamocha Valley and has a vegetation very similar to that found at san Gil.

Banding and data collection

In the initial phase the study area was marked with color tape where individuals of Niceforo's wren were recorded and those points were marked using a GPS. At these points nets were placed from 6:00 to 10:00 hours in the morning, during a two weeks period. The individuals of the different species were captured and measured. The following data was collected: tarsus length, culmen length, wing chord and tail length, body weight, age, sex, molt and skull pneumatization (Moreno et al., 2004). These measures were collected using a 100 grams pesola scale and a wing ruler. Nets were placed from 6:00 to 10:00 hours in the morning. The Niceforo's wrens were banded using different combinations color bands for identification of individuals on the field.

Territory size and individual density

To identify the territories and estimate its size, and to estimate the number of individuals present at the study area, we carried out a field experiment based on playbacks using Niceforo's wren songs recordings. The tape recordings were reproduced every 50 meters along 950 meters transects within the study area (Bella Isla location) and individual responses were recorded. Every track was reproduced during two days covering each day only half of the transect points. At the end of the experiment moving playbacks were reproduced to observe individual behaviors and to detect the possible territories boundaries as well as the densities and the territory size.

Behavior and vocalizations

We performed observations *ad libitum* (Lehner, 2002) using 8x40 binoculars. We observed a pair of Niceforo's Wren individuals and we recorded its foraging patterns (search, attack, foraging position, food and handling) following the classification proposed by Remsen and Robinson (1990). Vocalizations were recorded with Sony WMD6C tape recorder and Sennheiser ME66 microphone. We digitized and analyzed every recorded song using Canary (Charif et al. 1995).

Ecological requirements along the dry forests of the Chicamocha river basin

We traced one plot of 5m² where we saw individuals of Niceforo's Wren (10 plots). We used an 8 cm diameter cylinder with a grid to measure the following habitat features:

- Percentage of leaf litter

Choosing five random points, we placed the cylinder perpendicular to the ground at 1.5 meters high. We calculated the percentage of leaf litter comparing the number of squares covered by litter vs. not covered, and then averaging the five random plots results.

- Percentage of canopy cover.

Choosing five random points, we placed the cylinder perpendicular to canopy. We calculated the percentage of canopy cover comparing the number of squares covered by leaves and tree branches vs. not covered, and then averaging the five random plots results.

- Basal tree area

We measured the girths (GBH) of the trees within each plot to calculate the percentage of basal area occupied by trees.

- Vegetation cover

The vegetation cover was measured at five different levels using the method described by Montes (1998) and adapted by Noon (1981). We used a 30 cm x 4m cloth with 10 x 10 cm black and white squares (Fig. 8), with five levels categories: 0 to 0.5m, 0.5 to 1m, 1 to 2m, 2 to 3m. The cloth was placed perpendicular to the ground in the middle of the plot. From 10 meters distance we counted the number of squares covered by vegetation in each level from four different points (North, South, East and West), using binoculars.

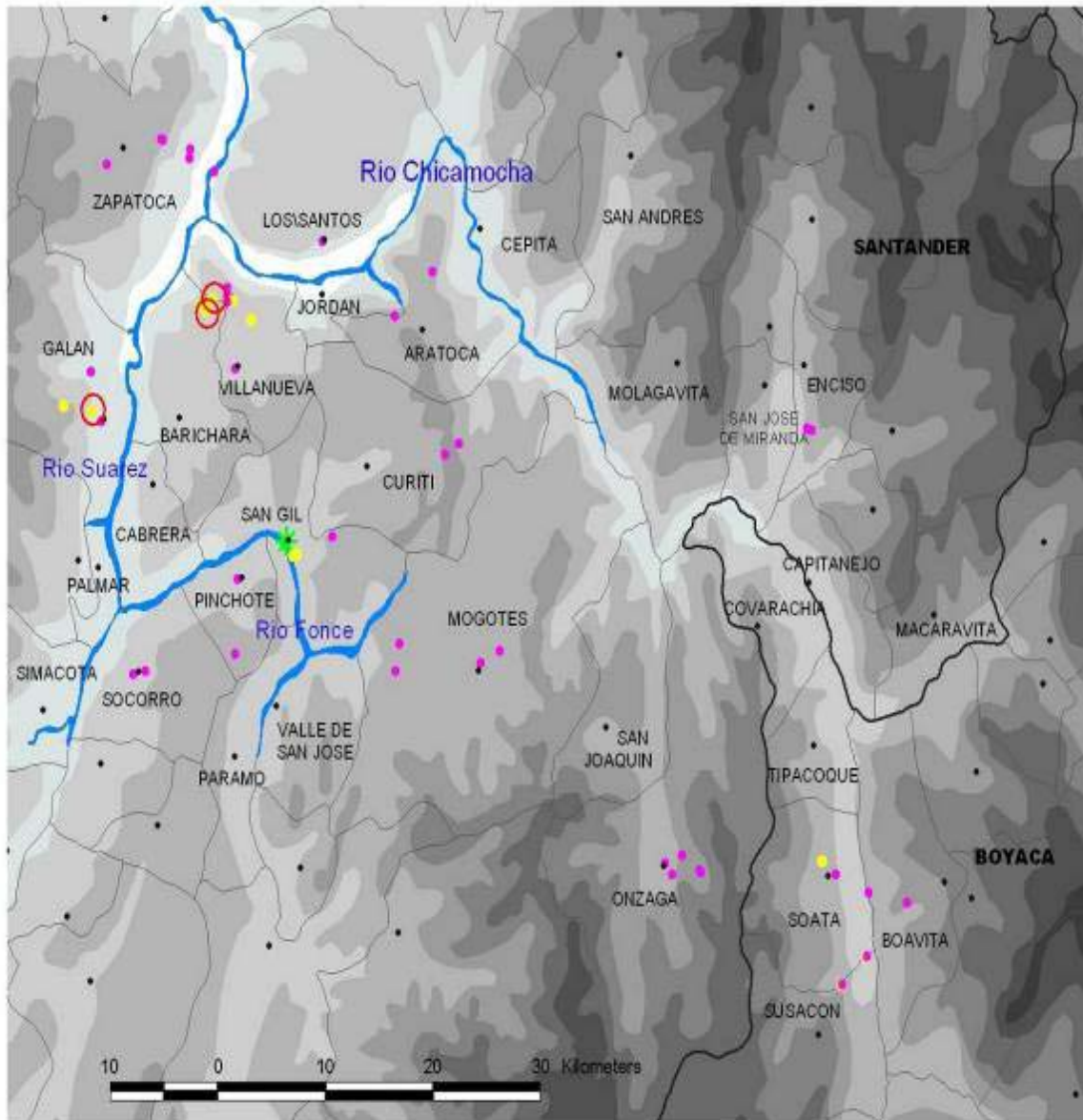
- Percentage of ground covered by rocks.

Choosing five random points, we placed the cylinder perpendicular to the ground at 1.5 meters high. We calculated the percentage of rocks comparing the number of squares covered by rocks vs. not covered, and then averaging the five random plots results.

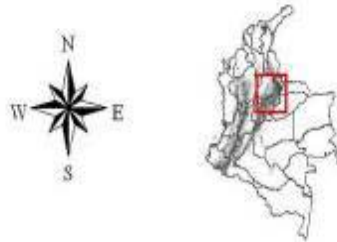
C. Results

i. Map the current distribution along of the Chicamocha Valley

Nicefo's Wren was recorded along of Chicamocha Valley in Boyacá and Santander provinces (Figure. 2). The Chicamocha team explored 18 places in 12 municipalities. *T. nicefori* was found in 7 places along Chicamocha, Sogamoso, Suárez, and Fonce rives basin (Figure. 2). The highest altitudinal record was at 1,840 m in El Mirador, Malaga Santander and the lowest altitudinal record was at 1132 m in Gallineral, San Gil Santander. The largest group recorded was 9 birds recorded in a river forest and semi-arid habitats in Gallineral, San Gil. Wrens were mainly recorded singing in the morning.



DISTRIBUCION DE
Thryothorus nicefori
GENERADA CON
LAS EXPLORACIONES



- Cabeceras
- Distribución exploraciones
 - exploraciones
 - exploraciones
 - T. nicef
 - D. historica
- Ríos primarios
- Departamentos
- Municipios

Figure 3. Niceforo's Wren new records of distribution in Chicamocha valley.

ii. Natural history

Species description

Morphology. We obtain the morphological data from three individuals that were captured (Table 1).

Table 1. Bird banding data. Niceforo’s wren individuals captured during field work.

Banding codes						Biometria (mm)						Weight	Site*	Record	
						Wing chord	Cola	Culmen length	Tarsus						
aluminum series		Color*	Lenght	wide	heig ht										
B	0	1	5	1	5	GAY	68	58	23,7	21,8	1.5	2.5	27	BI	Capture
B	0	2	1	1	6	AGY	70	57	22,6	21,8	1.6	2.1	29	G	Recapture
C	0	0	9	0	8	RBA	68	53	23,9	23,5	1.6	2.3	27	BI	Capture
B	0	1	4	8	3	OAR	70	56	22,7	23,9	1.4	1.7	25,5	MA	Capture

*G green, A aluminum, Y yellow, R red, B blue, O orange

*BI Bella Isla, G Gallineral, MA Macaregua (Curiti).

Territory size and individual density

Based on the response to the playback experiments (Figure 4) we identify two pairs of Niceforos wren each holding a territory. One pair responded to the play back experiments in points between 50 m and 400 m on transect while the other pair responded between 450 m and 650 m. There was no response between 450m y 650m. We found no more than a pair of Niceforo’s wren in each territory, nevertheless in Gallineral five individuals were captured during the explorations (July 2004).

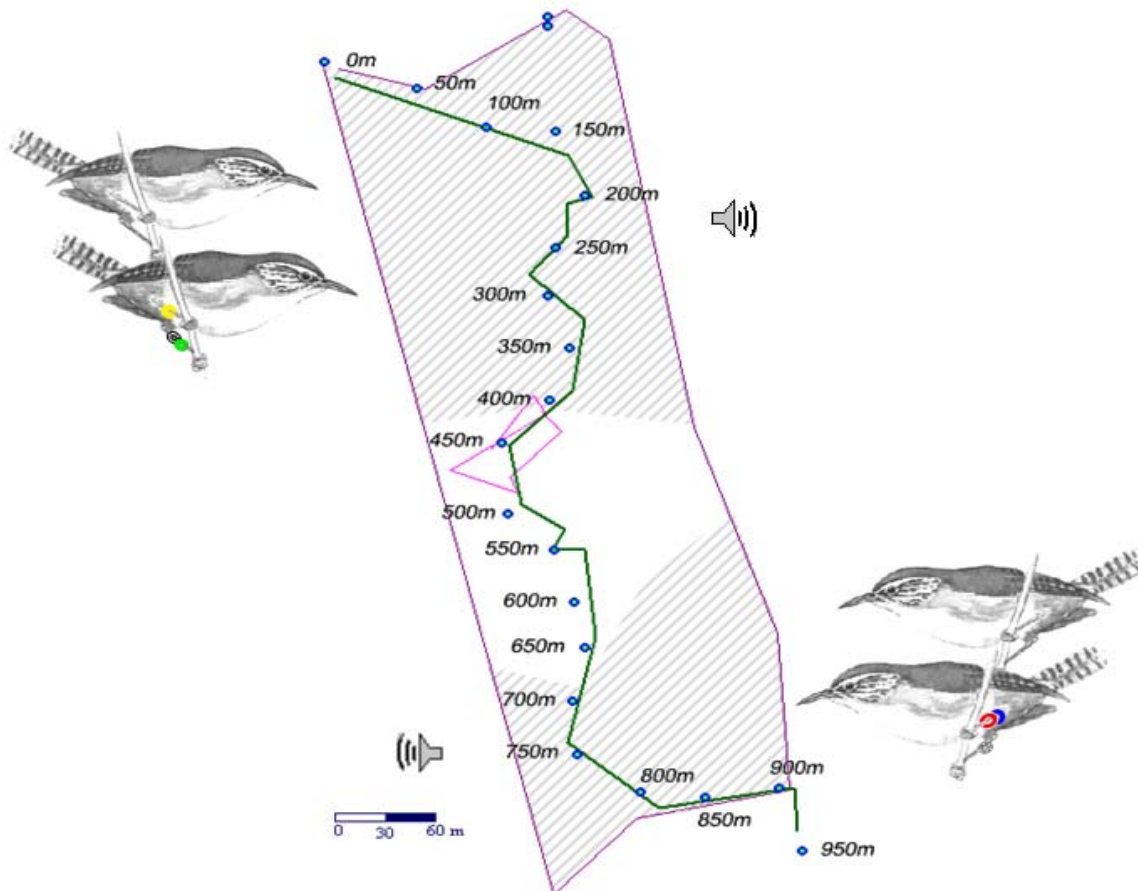


Figure 4. Territory size and area of response for each individual pair of Niceforo’s wren. Niceforo’s wren pairs (presence gray vs. absence).GAY (green aluminium yellow) and RBA (red blue aluminium). The area between 400 m and 500 m corresponds to a sector with predominance of grasses.

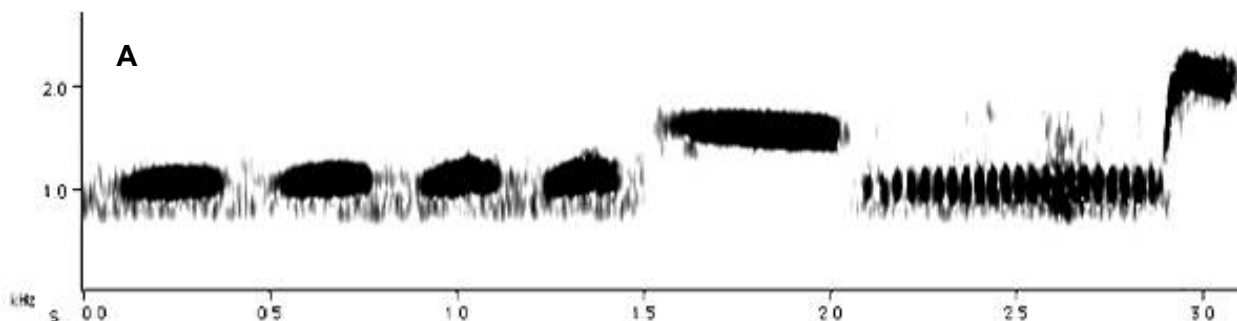
Behaviour

The individuals of Niceforo's wren were found mostly approximately at 0.91 ± 1.75 meters above the ground (0-2.66 m). The wren individuals were observed mainly foraging on the litter (ground), also were observed gleaning under dry leaves and pecking on branches and trees holes. As well were recorded on the litter exploring the thick foliage present in the area.

Vocalizations

- Song of *T. nicefori*, San Gil.

Typical song consists of four short pure introductory notes "buu-buu-buu-buu", mostly without harmonics, that are given at a frequency range, from 0.892 kHz down to about 1.342 kHz. Each note decreases in duration (0.314, 0.307, 0.238, 0.217 s respectability). Frequency peak of four notes is 1.120 kHz. Next note is short "buo" (0.524 s) given at a frequency range, from 1.352 kHz down to about 1.803 kHz, and frequency peak is 1.572 kHz. After, there is a trill with 22 short syllable "triiiiii..." (0.023 s each one) given at a frequency range between 0.853 kHz and 1.208 kHz, and at a frequency peak of 1.034 kHz. Finally, there is a short note "juit" (0.370 s) given at a frequency range between 1.218 kHz and 2.359 kHz, and at a frequency peak of 2.089 kHz. The duration of the song is 3.159 seconds, which on average is given each 6.01 seconds (Fig. 3 A). This song is the most common early in the morning and its function is possibility to contact the couple in the territory. Other song types are similar, but each one has a little variation within song. For example, songs can be "buu-buu-buo-buo-triiii...-juit" (Fig. 3 B), large note "uii" (Frequency range 1.347 – 1.968 kHz, frequency peak 1.464 kHz, 0.611 sec) "buu-buu-buu-buu-buu-buu-juit" (Fig. 3 C), "uii-buo-triiii...-juit" (Fig. 3 D), or "triiii-uii" (Fig. 3 E).



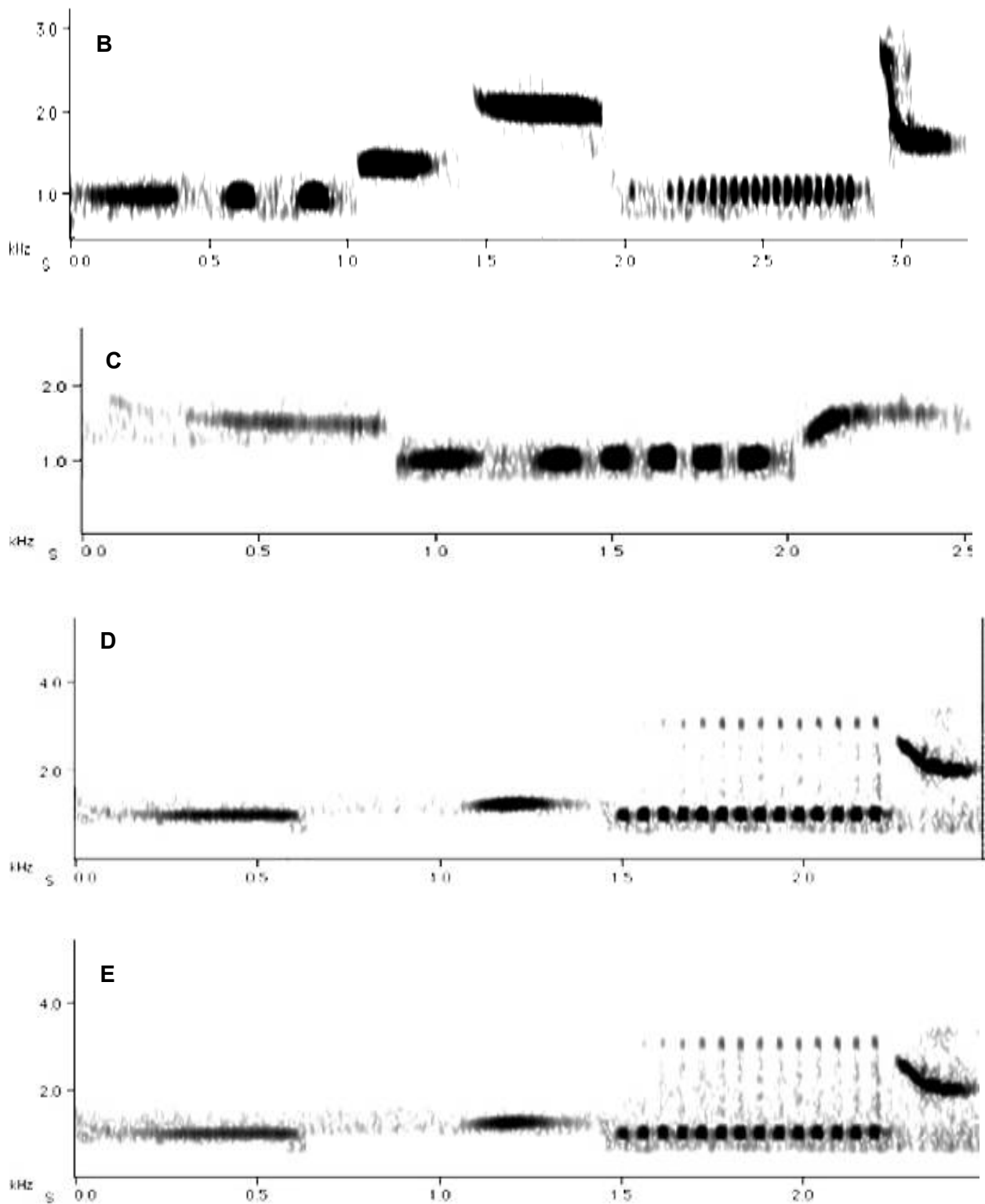


Figure 3. Five songs types of *Thyrothorus nicefori* recorded at Bella Isla, San Gil, Prov. Santander, Colombia.

- Song of *T. nicefori* (Espinal, Santander)

Typical song consists of large introductory note “uii” (0.832 s), that are given at a frequency range, from 1.33 kHz down to about 2.37 kHz, and frequency peak of 1.5 kHz. Next notes are 2 shorts “buo-buo” (0.078 s each one) with harmonics given at a frequency range, from 0.570 kHz down to about 1.10 kHz, and frequency peak is 0.900 kHz. Finally, there is a

large note “puii” (0.280 s) given at a frequency range between 0.790 kHz and 1.67 kHz, and at a frequency peak of 1.31 kHz. The duration of the song is 1.5 sec (Fig. 4 A). Other typical song of this individual is “buo-uii-triiiiiii-juit” of 2.117 sec (Fig. 4 B).

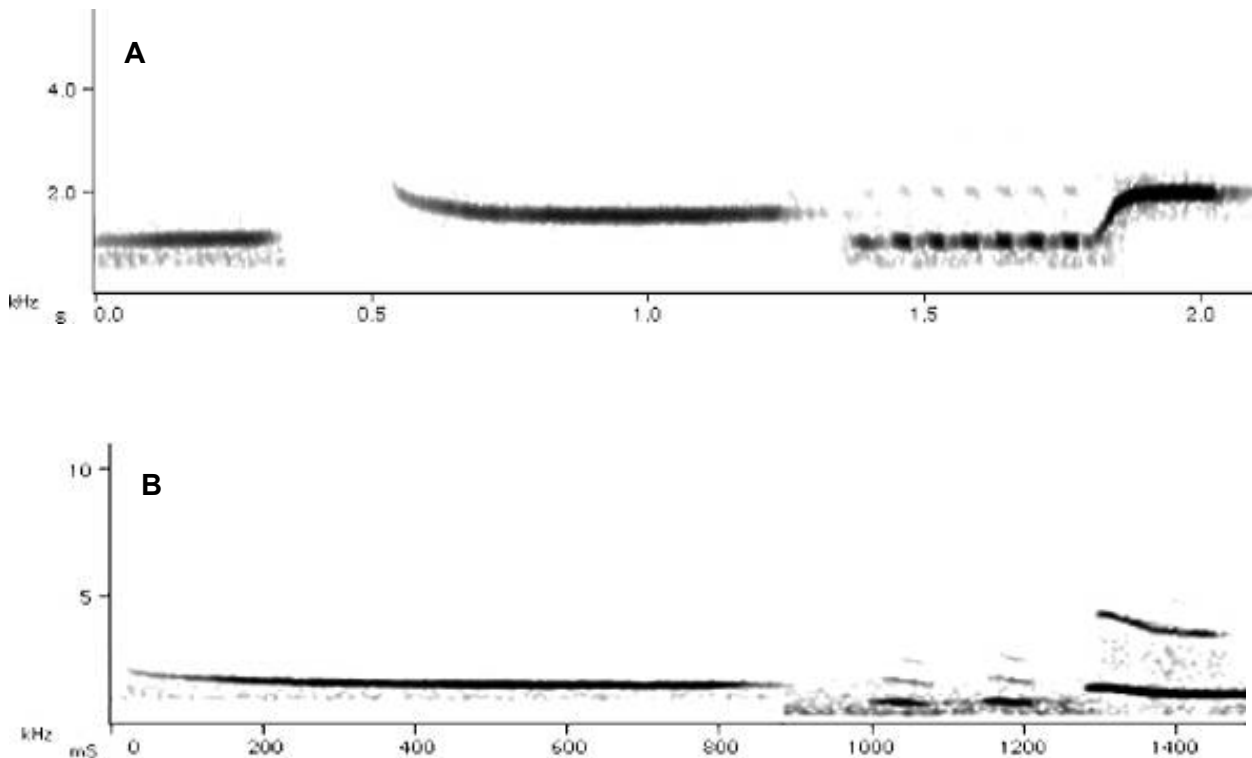


Figure 4. Two songs types of *Thryothorus nicefori* recorded at Espinal, Villa Nueva, Prov. Santander, Colombia.

- Song of *T. nicefori*, Galán

Typical song consists of five short introductory notes “buu-buu-buu-buu-buu” (0.252, 0.231, 0.222, 0.205, 0.155 s respectability), that are given at a frequency range, from 0.717 kHz down to about 1.182 kHz, and frequency peak of 0.926 kHz. Final note is large “puii” (0.571 s) given at a frequency range, from 1.279 kHz down to about 1.918 kHz, and frequency peak is 1.615 kHz. The duration of the song is 2.273 sec (Fig. 5).

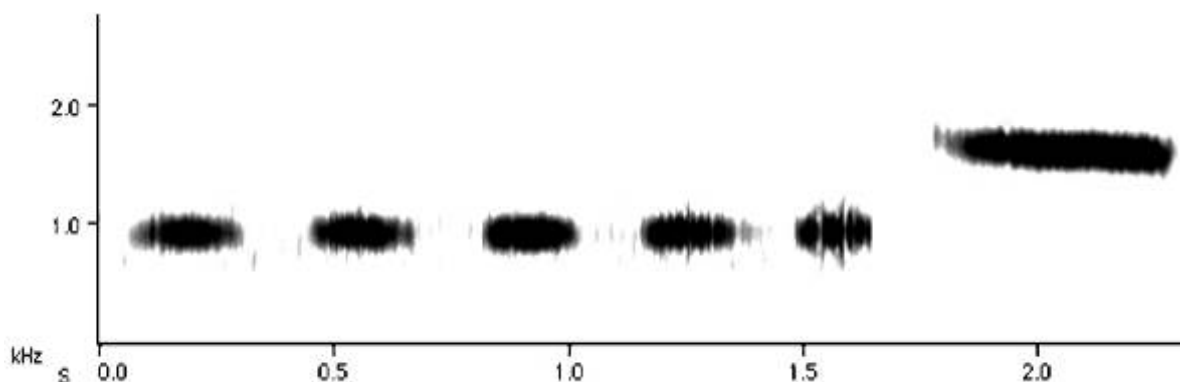


Figure 5. Song type of *Thryothorus nicefori* recorded at El Alto, Galán, Prov. Santander, Colombia.

First nest description

Three nests of the Niceforo's Wren were found under construction in the wet season, between August and early October 2004, located in the Municipalities of Galán (vereda El Alto) and Barichara (vereda Butaregua). The single-opening elbow-shaped globular nests were situated in the fork of trees, between 3 and 8 meters high. The nest measures 22 cm from front to back, 8.5 cm from side to side and 34.3 cm in height; the entrance had a diameter of 8 cm (fig.1). The nest was constructed with plant fibers (e.g. grasses, small plant stems, fibers from *Tillandsia usneoides* spp), and often materials are recycled from abandoned nests (Fig. 6).



Figure 6. *Thryothorus nicefori* nest.

iii. Principal ecological requirements

Ecological requirements along the dry forests of the Chicamocha river basin:

Table 2. Features of the sites where we saw *Thryothorus nicefori*. Data were registered in ten 5 m² plots.

Features	Mean \pm SD ^a	Range (%)
% leaf litter	44.95 \pm 22.68	13.96 - 80.75
% of ground covered by rocks	18.89 \pm 18.66	1.5 - 66.50
% of tree occupied area	4.64 \pm 3.98	0.44 - 6.36
% of canopy	76.65 \pm 17.26	27.01 - 99.65
% of leaf volume 0-0.5m	83.75 \pm 12.81	65 - 100
% of leaf volume 0.5-1 m	75.71 \pm 15.67	60 - 100
% of leaf volume 1-2m	73.50 \pm 17.70	62.5 - 92.50
% of leaf volume 2-3m	76.50 \pm 19.40	37.5 - 100
% of leaf volume 3-4m	73.60 \pm 25	38.8 - 100

^aSD= standard deviation.

- Altitude.

In the explorations along Chicamocha river basin, *Thryothorus nicefori* individuals were observed between 1132 and 1795 m extending its altitudinal range, originally know only from one location at 1095 mals (Birdlife International, 2004).

- Habitat characteristics.

Niceforo's Wren was found in areas where habitat is highly modified and its degradation is apparently continuing. Was found along streamsides where riparian tangled vegetation remains, also found in shadow coffee and cacao plantations. Its actual distribution is extremely restricted.

We found Niceforo's Wren in 10 Municipios (Departamento de Santander), new records that broaden originally distribution along the Chicamocha valley. We found Niceforo's Wren on Cacao plantations that present shadow from bigger trees and in sidestreams. These sidestream presents three strata, the first (0-2 meters) undergrowth, composed by seedlings and small bushes (*Piper* sp), the second (5-7 meters), small bushes and tangled vegetation, a third strata composed by canopy trees like Caracoli (*Anacardium excelsum*) and Ficus, mostly of these trees presenting epiphytes (*Tillandsia usneoides* sp).

- Habitat structure.

In the 5m² plots that we traced in places where we saw *T. nicefori*, the average of the percentage of leaf litter was 44.96%, the average of the percentage of ground covered by rocks was 18.89%, the average of the percentage of canopy cover was 76.65%, and the percentage of tree occupied area was 4.64% (Table 1). The percentage of leaf volume was always superior to 37.5%, and the leaf volume was similar in all layers (Table 1 y Fig. 7).

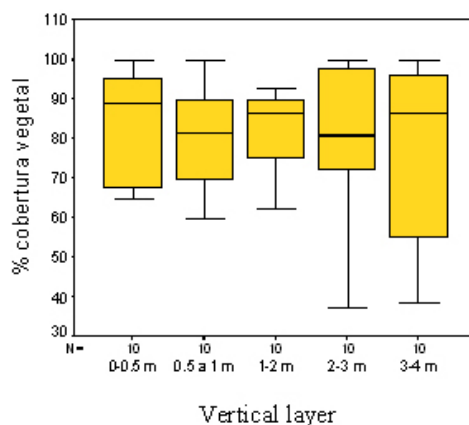


Figure 7. Percentage of leaf volume in the sites where we record *Thryothorus niferori*. Data were registered in ten plots. In each site we analyzed five vertical layers.

Discussion

Natural history

The Niceforo's wren vocalization structure was similar to the structure of Rufus and White wren found by Menill and Veherencamp (2005). Niceforo's wren has a large repertoire of songs. The principal functions of songs are territoriality, and contact between couple. Song structures are highly distinctive to the human ear and differ in duration (1.086 to 3,236 seconds), number of notes and syllable types (3 to 5), and note shape and syntax. Males introduce variation within song types during bouts, but the number of notes in the trills may vary slightly, and introductory notes may be dropped. Different population songs have similarities but each population has its property types of song as the conspecific *Thryothorus* genera.

The results of territories size shows a direct relation with the fragment size. In the larger fragment (Bella Isla), the territories found were larger and on the other hand the smaller isolated fragments (Macaregua y Gallineral) determine the size of the territories established.

It is necessary to obtain new population records that allow comparisons to be made, including the fragments size and the distance between them. On the other hand it is possible that the vocalizations of the Niceforo's wren could have smaller differences in vocalizations structures if compared with the two subspecies *T. rufalbus minlosi* and *T. rufalbus cumanensis*, since the comparisons were made with the Rufus and White wren from Costa Rica (Mennill y Veherencamp 2005).

Ecological requirements and habitat use.

Our results show that Niceforo's Wren lives in areas with abundant vegetation cover and abundant leaf litter (Table 2). We found individuals on riparian forest fragments with tangled vegetation composed by shrubs and thorn scrubs and coffee plantations (that could possibly replaced some originally vegetation structure).

The Niceforo's wren was observed foraging between 0 m and 7 m, and was found predominantly foraging at the ground gleaning on dry dead leaves. These results are very similar to those found by Ahumada (2001) for the White and Rufous wren. Similar to others species of *Thryothorus*, Niceforo's Wren is associated with tangled vegetation and feed primarily on insects related to litter, thus this vegetation characteristic are outstanding to its

maintenance. In consequence this species is vulnerable to forest fragmentation and human activities.



5. NEW BIRD RECORDS FROM THE DRY FOREST OF THE CHICAMOCHA VALLEY, A RECENTLY SELECTED IMPORTANT BIRD AREA

ABSTRACT

We present information about the distribution of 168 species and status of some species of birds from the Chicamocha Canyon dry valleys of the eastern cordillera of Colombia. From June 2004 to January 2005 15 explorations were carried out in 15 municipalities of Boyacá and Santander departments. We reported new localities of Niceforo's wren (*Thryothorus nicefori*) and chestnut-bellied hummingbird (*Amazilia castaneiventris*), both critically endangered species, endemic to the dry valleys of the Eastern Cordillera. Three other species, hook-billed kite (*Chondrohierax uncinatus*), black-chested buzzard eagle (*Geranoaetus melanoleucus*), and troupial (*Icterus icterus*) represent first reports of new localities for their actual geographic and altitudinal distribution in Colombia. Finally, we reported localities of 5 endemic species and subspecies (*Ortalis (motmot) colombiana*, *Momotus momota olivaresii*, *Myiarchus apicalis*, *Campylorhynchus griseus bicolor*, *Arremon schlegeli canidorsum*). We also give recommendations for the conservation of this ecosystem.

INTRODUCTION

The Chicamocha Canyon is located in the Eastern Cordillera of Colombia, which belongs to the mid valley of the Chicamocha River and to those of others that empty in it, such as the Suárez River. This is a tropical subxerofitic area, which goes from Soatá to Paz del Río, two municipalities of the department of Boyacá. Its semiarid characteristic is a result of different factors, such as geologic, climatic, and antropogenic, which have contributed to the soil's degradation and the decrease in plant diversity. The flora that grows in the Chicamocha Valley is very diverse, especially in the Cactaceae family, which lacks a lot of research, and thorny shrubs (Hernández *et. al* 1992).

The annual rains in this canyon are of 730.7 mm, which equals the real evapotranspiration. The annual mean temperature is 25.4°C, and the soil's slope is 20°, and all of these facts determine the low water retention (or absorption), as well as the floral composition and distribution, and the vegetation structure in two patterns (Albesiano *et al.* 2003): 1) the thorny shrubs and cardonales are established in the hillsides with smooth to sharp slopes, with little evolved grounds that have low organic matter. The dominant species are *Cnidoscolus tubulosus*, *Cordia curassavica*, *Jatropha gossypifolia*, *Lantana canescens*, *Limpia organoides*, *Opuntia depauperata*, *Prosopis juliflora*, *Senna pallida* y *Stenocereus griseus*: 2) the riverine woods are settled down in the affluents borders with mid organic matter content, where agricultural work is being developed. The main species are *Abutilon giganteum*, *Abutilon umbellatum*, *Bouchea boyacana*, *Cardiospermum coluteoides*, *Cleome*

sp., *Rauwolfia tetraphylla*, *Solanum crotonifolium*, *Stemmadenia grandiflora*, *Thevetia peruviana*, *Tridax procumbens* y *Trophis caucana*.

There are no protected areas in the Chicamocha Valley zone. According to Hernández *et. al* (1998), it is important to establish some type of reserved area in search of the conservation of the great quantity of endemic animal and plant species (Aves: *Amazilia castaneiventris*, *Thryothorus nicefori*, *Momotus momota olivaresii*, *Campylorhynchus griseus bicolor*, *Arremon schlegeli canidorsum* entre otras; Reptiles: *Micrurus bocourtiangilensis*; Anfíbios: *Bolitoglossa nicefori*.)

The main goal of this research is to provide information about the status and distribution of the registered avian species during the making of the Chicamocha Project, which will enlarge the region's biodiversity inventory.

METHODS

Data were collected during fieldwork within the "Chicamocha Project" from June 2004 to January 2005. Study areas were visited monthly during 20 days. Bird populations were monitored using standardised methodologies for assessing bird population abundance (mist-netting [8x12 m], non-systematic field observations, and tape-recordings). Birds were measured, photographed and selectively marked with metal rings onto bird legs. Tape recordings, using a Sony WM-D6C and Sennheiser ME66 microphone, were made on most days; copies of recordings have been deposited at The British Library in London, and Banco de Sonidos Animales (BSA) in the Alexander von Humboldt Institute, Villa de Leyva, Colombia.

Data were obtained at 15 field sites distributed from Boyacá to Santander (Fig. 1).

(GUA) Guásimo: located on the northern valley of the Chicamocha river in the municipality of Jordán, Santander (06° 42' 24,78 ''N, -73° 02' 31.92'' W), at an elevation of 1,590 m. The area is dominated by private coffee farms where was carried out the study.

(BUT) Butaregua: located on the right side of Suarez river in the municipality of Barichara, Santander (06° 42' 52,74 ''N, -73° 11' 59.97'' W), at an elevation of 1,200 m. The area is dominated by parch of riverine forest and xerophitic shrubs.

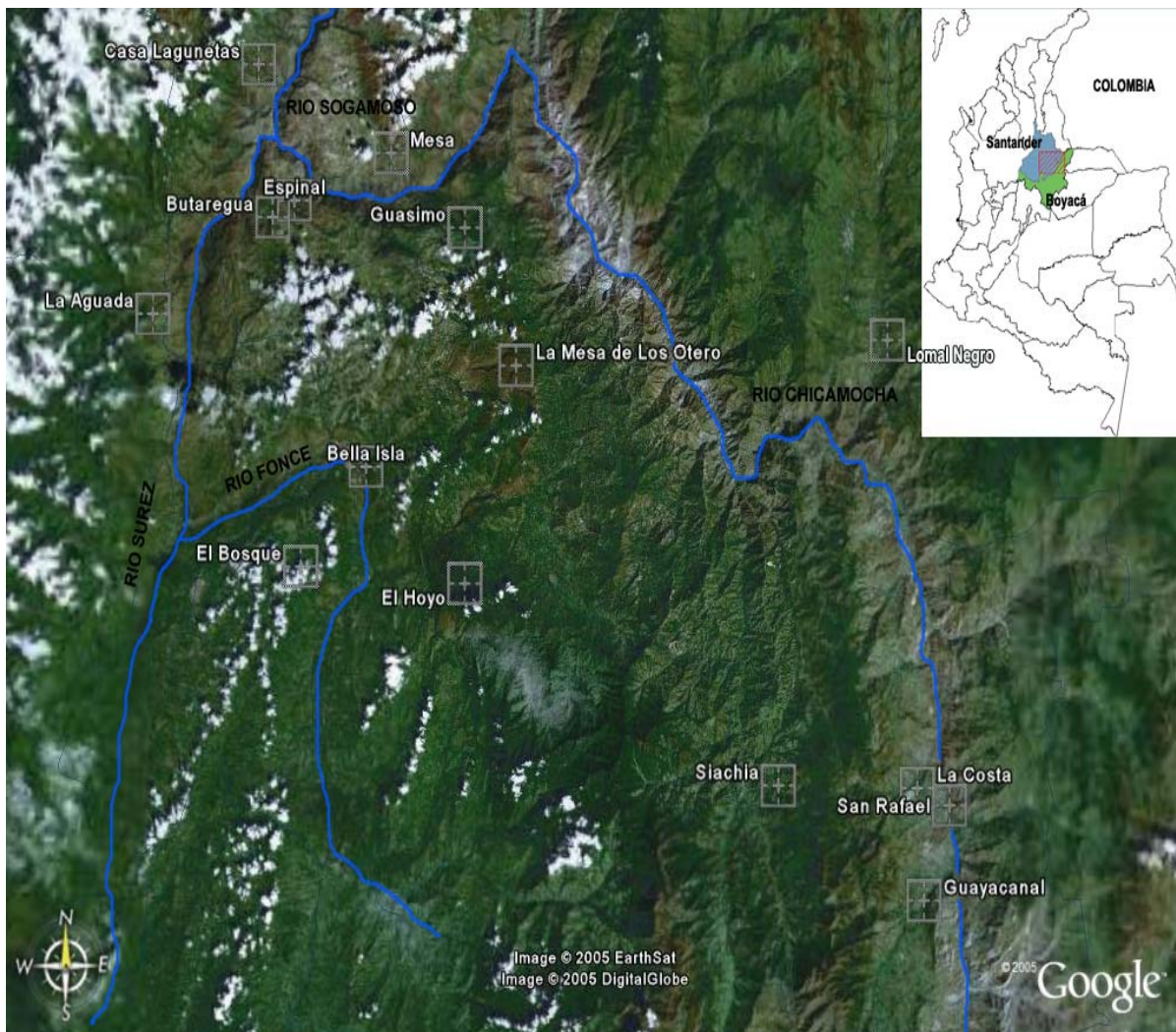


Figure 1. Exploration map of Chicamocha Canyon, showing the 15 spots.

(HOY) El Hoyo: located on the Mogotes altiplane of the municipality of Mogotes, Santander ($06^{\circ} 28' 19.35''$ N, $-73^{\circ} 02' 31.01''$ W), at an elevation of 1,760 m. The area is dominated by private coffee and tobacco farms. “El Hoyo de los Guacharos” is located here, with a great colony of *Steatornis caripensis* (about 1000 individuals).

(LAG) Lagunetas: This site is the best conserved dry forest located on the left side of Sogamoso river in the Finca Lagunetas, municipality of Zapatoca, Santander ($06^{\circ} 48' 41.57''$ N, $-73^{\circ} 12' 50.49''$ W), at an elevation of 740 m. The area is dominated by xerophitic shrubs and riverine forests, where the principal economic activity is goat cattle raising.

(AGU) La Aguada: located on the left side of Suarez river in the municipality of Galán, Santander ($06^{\circ} 39' 00.97''$ N, $-73^{\circ} 17' 50.99''$ W), at an elevation of 1,220 m. The area is dominated by private coffee farms and riverine forest.

(BOS) El Bosque: located on the right valleys of Suarez river in the municipality of Pinchote, Santander (06° 28' 59,33 ''N, -73° 10' 31.46'' W), at an elevation of 1,780 m. The area is dominated by private coffee farms and dry forest patches.

(OTE) Mesa de los Otero: located on the left altiplanes and valleys of Chicamocha river in the municipality of Curití, Santander (06° 36' 54,87 ''N, -73° 00' 00.11'' W), at an elevation of 2100 m. The area is dominated by pastures, patches of riverine Andean forest and forest of Andean oak (*Quercus humboldti*).

(BEL) Bella Isla: : located on the right side of Fonce river in the municipality of San Gil, Santander (06° 32' 57,22''N, -73° 07' 23.41'' W), at an elevation of 1150 m. The area is dominated by dry forest, xerophitic shrubs, riverine forest and urban houses of San Gil city.

(SIA) Siachia: located on the left valleys of Chicamocha river in the municipality of Onzaga, Santander (06° 20' 24,10''N, -72° 47' 16.34'' W), at an elevation of 2110 m. The area is dominated by private coffee farms, pastures and riparian Andean forest.

(ESP) Espinal: located on the left valleys of Chicamocha river in the municipality of Villa Nueva, Santander (06° 43' 33.34''N, -73° 10' 56.88''W), at an elevation of 1120 m. The area is dominated by xerophitic shrubs and small patches of riverine forests, where the principal economic activity is goat cattle raising.

(LOM) Lomal Negro: located on the right valleys of Chicamocha river in the municipality of Peña Colorada, Santander (06° 37' 57.7''N, -72° 41' 53.1''W), at an elevation of 1100 m. The site has long areas of high agricultural production and some patches of riparian forests.

(MES) La Mesa: located on the right valleys of Chicamocha river in the municipality of Mesa de los Santos, Santander (06° 45' 23.55''N, -73° 06' 09.51''W), at an elevation of 1310 m. The area is dominated by xerophitic shrubs, dry forest patches and small riparian forests, where the principal economic activity is goat cattle raising.

(RAF) San Rafael: located on the right valleys of Chicamocha river in the municipality of Boavita, Boyacá (06° 19' 31.3''N, -72° 38' 48.9''W), at an elevation of 1400 m. The area is dominated by xerophitic shrub patches, small riverine forests and high agricultural production.

(COS) La Costa: located on the left valleys of Chicamocha river in the municipality of Soatá, Boyacá (06° 20' 15.6''N, -72° 40' 28''W), at an elevation of 1600 m. The area is dominated by xerophitic shrub patches, small riverine forests and high agricultural production.

(GUY) Guaya canal: located on the left valleys of Chicamocha river in the municipality of Susacón, Boyacá (06° 15' 49.7''N, -72° 40' 08.9''W), at an elevation of 1700 m. The area is dominated by xerophitic shrubs patches, small riparian forests and high agricultural production.

RESULTS

We will introduce registrations of some avian species and subspecies' new distributions found in the Chicamocha Valley, some of which are endemic, as well as comments about these findings. Such registers are shown in Table 1.

Black-chested buzzard eagle, *Geranoaetus melanoleucus*.

On 9 November 2004, at Finca Lagunetas, Municipio of Zapatoca, Departamento de Santander, we observed a pair of the Black-chested Buzzard eagle (probably male and female) soaring near a goat stable, and few minutes later both individuals soared high over a rugged terrain into the mountains. The Black-chested Buzzard eagle is distributed in Colombia in the eastern and central Andes above the 1600 meters, mostly found over humid mountain canyons, temperate forest and lower páramo (Fig. 2). This eagle had not been recorded at low altitude in Colombia, however at Lagunilla in Venezuela had been reported over cactus scrub and is normally found in dry regions in Peru and Chile (Hilty & Brown 1986). The presence of this species on the Chicamocha dry forest is probably due to a great sort of prey availability, animals like Rabbits (*Sylvilagus brasiliensis*), Paca (*Agouti paca*), Central American agouti (*Dasyprocta punctata*), Prehensile-tailed porcupine (*Coendou prehensilis*), Banded Anteater (*Tamandua mexicana*), Crested Bobwhite (*Colinus cristatus*) and Speckled Chachalaca (*Ortalis columbiana*), are very common and available as carrion in the area (obs. Pers.).

Hook-billed kite, *Chondrohierax uncinatus*.

This species has been reported in Colombia mostly in lowlands up to 1000 meters in the Caribbean region, in the upper Sinú valley and east of the Andes from Boyacá and west Meta (Fig. 3). This species is occasionally found in thorn scrub in Santa Marta area (Caribbean region) (Hilty & Brown 1986). On November 10th 2004, at Finca Lagunetas, Municipio of Zapatoca, Departamento de Santander, we found a female perched in a 4 meters thorn scrub. This record is probably due to the presence of numerous land snails, the principal food resource for this species. Although the area present harsh conditions, canopy

and understory vegetation could probably create the moisture condition necessary for these land snails. This species could probably enter this area from the middle Magdalena valley where it was formerly distributed (Hilty & Brown 1986).

Colombian chachalaca, *Ortalis colombiana*

Ortalis colombiana is endemic to Colombia, where it has been extirpated from much of its range (Fig. 4). The remaining populations are restricted to fragmented pockets of forest, forest edges and scrubby woodland from 100 to 2,500 m altitude (Hilty and Brown 1986). Habitat has been subject to extensive deforestation, although some large areas of forest apparently still exist. The species is described as "rare" in some parts of its range (Stotz *et al.* 1996), though it is described as 'abundant' in protected areas in the Cauca Valley (Velasco 1997), and so it is not believed that it is approaching the thresholds for the population size criterion of the IUCN Red List (BirdLife International 2004). 19 individuals were registered in 7 places in the dry valleys of the Chicamocha Canyon, where they were seen, heard, photographed, and in some occasions, recorded (Table 1) with this being its first registry in this area. These observations were made in thorny shrubs and entangled riverine woods. They were also observed and heard in valleys with steep rocky walls "Sinchos" with some deciduous vegetation. The main threat for this species is habitat loss and hunting. It is a frugivore species and has an important role in seed dispersal a hence in regenerating the Chicamocha Canyon's main vegetation and other ecological processes.

Chestnut-bellied hummingbird, *Amazilia castaneiventris*

This species is ranked as Critically Endangered because it has an extremely small known range in which suitable habitat is severely fragmented and continuing to decline (BirdLife International 2004). Chestnut-bellied hummingbird was recorded along of Chicamocha Valley in Boyacá and Santander provinces (Fig. 5). *A. castaneiventris* was found in 8 places along Chicamocha and Sogamoso river's basins. The highest altitudinal record was at 2,100 m in Soatá, and the lowest altitudinal record was at 730 m in Finca Lagunetas, (Zapatoca, Santander). The largest group recorded was 8 birds, early one morning in agricultural field with trees of *Thricantera gigantea* with flowers, in a place called Jabonera, near Soatá. Hummingbirds were mainly recorded near plants with flowers of cactus (*Opuntia sp.*) and trees of Yatago (*Thricantera gigantea*).

Blue-crowned Motmot, *Momotus momota olivaresii*

This is an endemic subspecies of Chicamocha canyon in Colombia Colombia, which has a large range (BirdLife International 2004; Fig. 6). The global population size has not been quantified, but it is believed to be large as the species is described as 'common' in some

parts of its range (Stotz et al. 1996). *M. momota olivaresii* is commonly found in the higher parts of thorny shrubs, and occasionally nests near houses and the coffee plantations.

Apical Flycatcher, *Myiarchus apicalis*

Myiarchus apicalis is endemic to Colombia. This species has an estimated global extent of occurrence of 42,000 km² (BirdLife International 2004) (Fig. 7). The global population size has not been quantified, but it is believed to be large as the species is described as 'frequent' in parts of its range (Stotz et al. 1996). It is found in dry thorny shrubs in the canyon, open areas, and also in coffee plantations hunting insects. Its presences can be classified as "common" (Table 1).

Bicoloured Wren, *Campylorhynchus griseus bicolor*

Campylorhynchus griseus bicolor is another endemic subspecies of Chicamocha canyon in Colombia. The global population size has not been quantified, but it is believed to be large as the species is described as 'common' in some parts of its range (Stotz et al. 1996). It is common in plantations with living fences and in trees in this region. Its particular song is very well known by the people, who commonly call it "cuchica", and it builds its communal nests near houses and parks of the nearby towns (Fig. 7).

Niceforo's Wren, *Thryothorus nicefori*

Niceforo's Wren *Thryothorus nicefori* is endemic to the Chicamocha Valley of Colombia (Hilty & Brown 1986). This species has been known in only one site in a region where the environment is highly modified and habitat degradation is apparently endless. Its known population is tiny and inferred to be declining, and its range is extremely small. This combination of factors leads to classification as Critically Endangered (BirdLife 2004, Renjifo et al. 2002). The only known site is the type-locality at San Gil on the Fonce River, south of Bucaramanga, where ten specimens were collected between 1944 and 1948. There were no further records until two birds were observed and recorded in 1989, and then again in 2000 (BirdLife 2004, Renjifo et al. 2002). The Chicamocha team explored 15 places in 15 municipalities. *T. nicefori* was found in 9 places along Chicamocha, Sogamoso, Suárez, and Fonce river basin (Table 1). The highest altitudinal record was at 1,840 m in El Mirador, Málaga, Santander, and the lowest altitudinal record was at 1132 m in Gallineral, San Gil, Santander. The largest recorded group had 9 birds, in a riverine forest and semi-arid habitats in Gallineral, San Gil. Wrens were mainly recorded singing in the morning (Fig. 8).

Troupial, *Icterus icterus*.

On 12-18 November 2004, at Finca Lagunetas, Municipio of Zapatoca, Departamento de Santander, we observed and heard several Troupial individuals. They were usually seen in

pairs, sometimes accompanying mixed-species flocks on arid scrubs and columnar cacti, foraging on fruits and insects. Vocalizations of this species were heard early in the morning and at noon, decreasing drastically in the afternoon. We observed two individuals in a mixed species flock, along with other species such as *Icterus chrysater*, *Thraupis episcopus*, *Tangara vitriolina*, *Dendroica fusca*, *Parula pitiayumi*, *Elaenia frantzii*, *Formicivora grisea*, *Xiphorhynchus picus* and *Melanerpes rubricapillus*. This species is settled in the Guajira (south east base of the Sierra Nevada de Santa Marta) and north of Arauca and Vichada (Hilty & Brown 1986) (Fig. 9).

Golden-winged Sparrow, *Arremon schlegeli canidorsum*

Arremon schlegeli canidorsum is another endemic subspecies of Colombia. This species has a large range. The global population size has not been quantified, but it is believed to be large as the species is described as 'frequent' in parts of its range (Stotz et al. 1996). It inhabits shrubs, dry and riverine forests in the understory, in the Chicamocha Canyon (Fig. 10). They are usually seen in pairs in an established territory, and it is believed it's a monogamous species. Its songs were recorded in Butaregua.

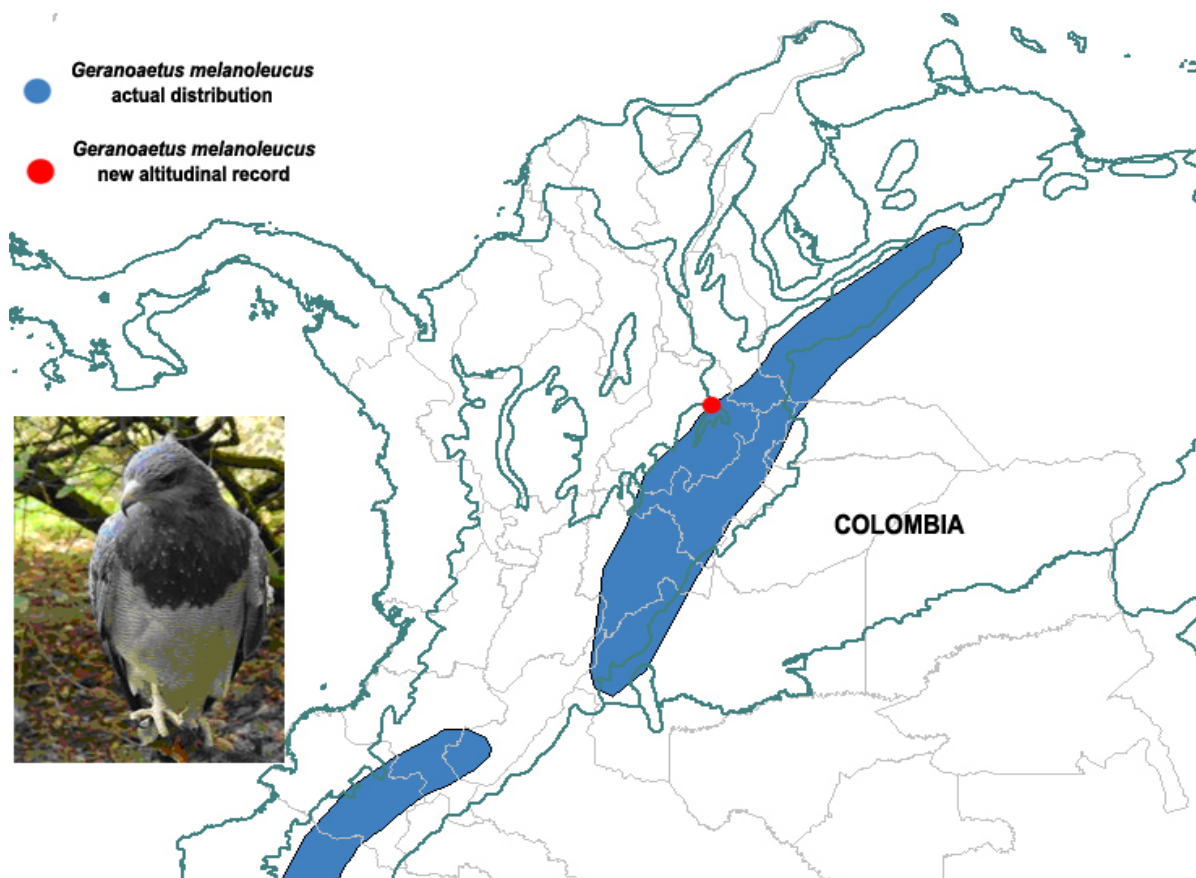


Figure 2. Actual and new distribution of *Geranoaetus melanoleucus*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA.



Figure 3. Actual and new distribution of *Chondrohierax uncinatus*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA



Figure 4. Actual distribution of *Ortalis colombiana*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA

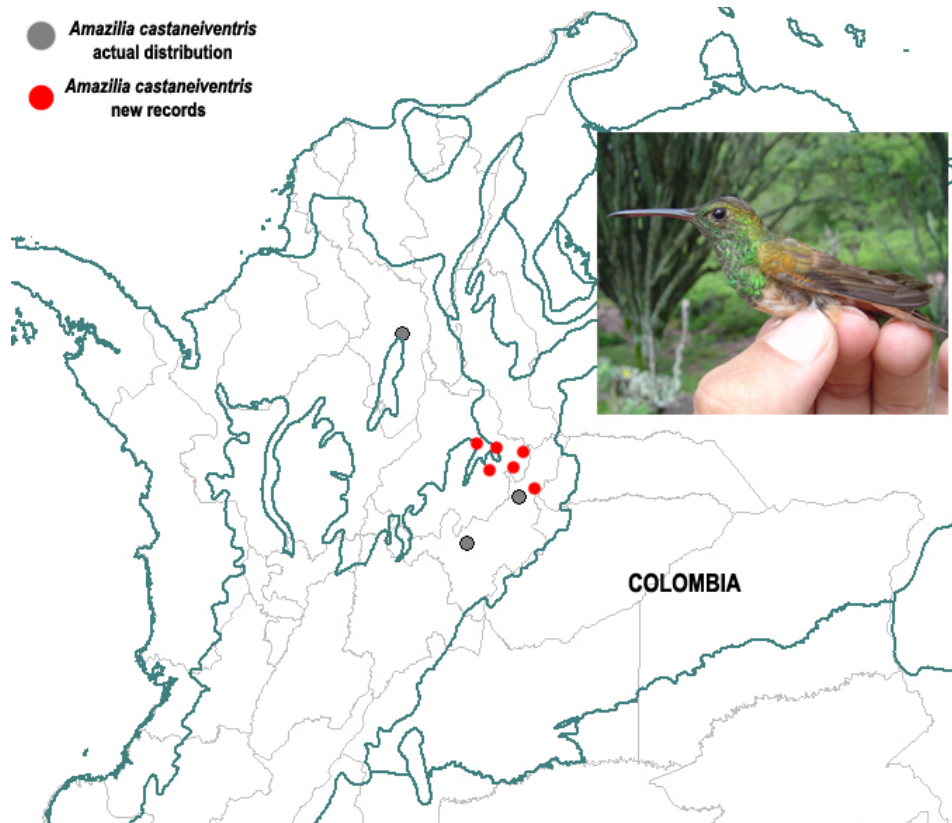


Figure 5. Actual and new distribution of *Amazilia castaneiventris*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA



Figure 6. Actual distribution of *Momotus momota*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA



Figure 6. Actual distribution of *Myiarchus apicalis*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA

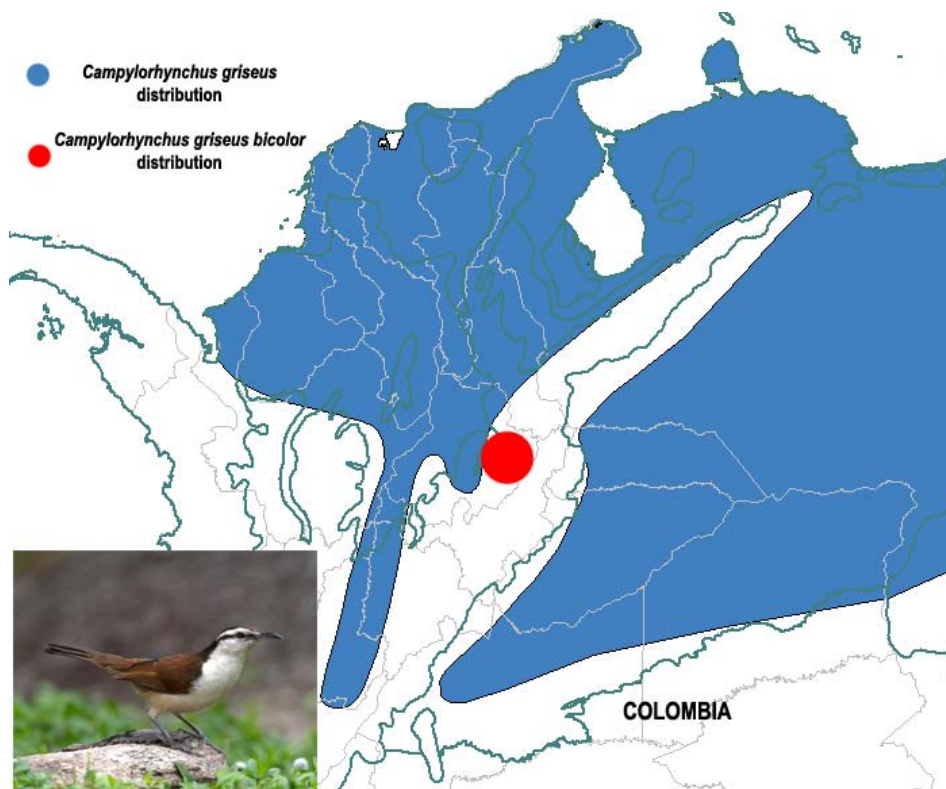


Figure 7. Actual distribution of *Campylorhynchus griseus*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA

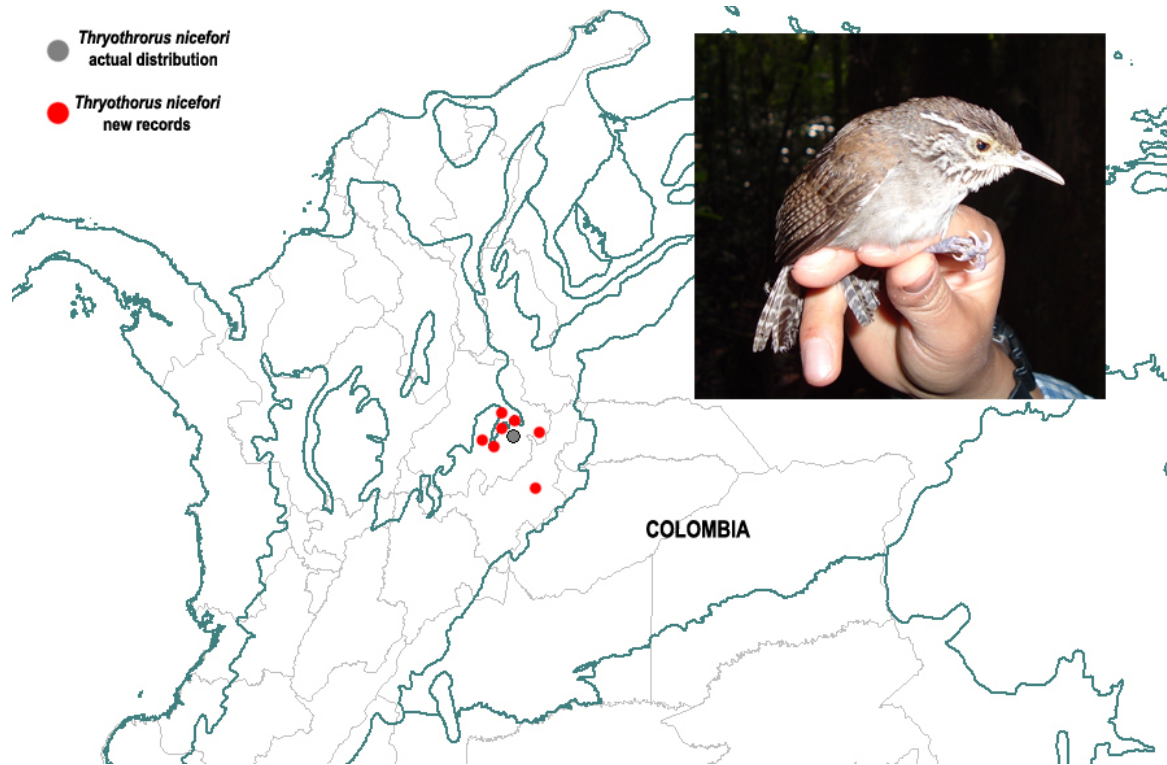


Figure 8. Actual and new distribution of *Thryothorus nicefori*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA



Figure 9. Actual and new distribution of *Icterus icterus*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA

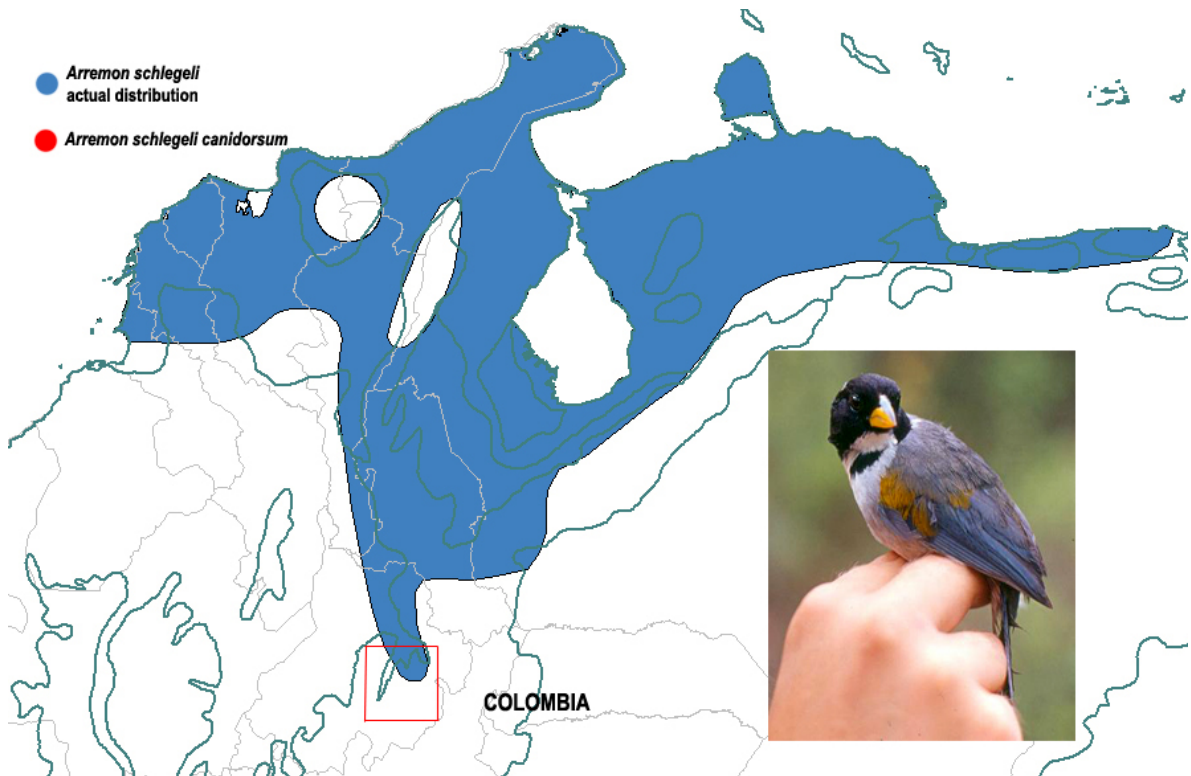


Figure 10. Actual distribution of *Arremon schlegeli*. Ridgely, R. S., T. F. Allnutt, T. Brooks, D. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2005. Digital Distribution Maps of the Birds of the Western Hemisphere, version 2.1. NatureServe, Arlington, Virginia, USA.

Table 1. Avian species and their distribution along the Chicamocha Valley.

N°	Orden	Familia	Genero	Especie	Taxon	GUA	BUT	HOY	LAG	AGU	BOS	OTE	BEL	SIA	ESP	RAF	COS	LOM	MES	GUY
1	FALCONIFORMES	CATHARTIDAE	Cathartes	aura	<i>Cathartes aura</i>	x	x	x	x	x	x	x	x	x	x					
2			Coragyps	atratus	<i>Coragyps atratus</i>	x	x	x	x	x	x	x	x	x	x					x
3		ACCIPITRIDAE	Geranoaetus	melanoleucus	<i>Geranoaetus melanoleucus</i>				x											
4			Buteo	albicaudatus	<i>Buteo albicaudatus</i>	x	x	x							x					
5			Buteo	magnirostris	<i>Buteo magnirostris</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6			Chondrohierax	(uncinatus) uncinatus	<i>Chondrohierax uncinatus</i>				x											
7			Accipiter	(striatus) erythronemius	<i>Accipiter erythronemius</i>									x						
8			Gampsonyx	swainsonii	<i>Gampsonyx swainsonii</i>					x			x				x			
9		FALCONIDAE	Falco	sparverius	<i>Falco sparverius</i>	x	x	x	x	x	x	x	x		x					
10			Milvago	chimachima	<i>Milvago chimachima</i>		x		x						x					
11			Falco	ruficularis	<i>Falco ruficularis</i>				x											
12	GALLIFORMES	CRACIDAE	Ortalis	(motmot) colombiana	<i>Ortalis colombiana</i>	x	x		x	x		x	x		x					
13		PHASIANIDAE	Colinus	cristatus	<i>Colinus cristatus</i>	x	x	x	x	x		x	x		x					
14	CHARADRIIFORMES	SCOLOPACIDAE	Tringa	solitaria	<i>Tringa solitaria</i>			x												
15	COLUMBIFORMES	COLUMBIDAE	Leptotila	verreauxi	<i>Leptotila verreauxi</i>	x	x	x	x	x	x	x	x		x	x	x	x	x	x
16			Columbina	(talpacoti) talpacoti	<i>Columbina talpacoti</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17			Zenaida	auriculata	<i>Zenaida auriculata</i>			x	x					x						
18			Columbina	passerina	<i>Columbina passerina</i>	x	x		x	x	x		x		x					
19			Columba	fasciata	<i>Columba fasciata</i>				x							x				
20			Columbina	minuta	<i>Columbina minuta</i>				x						x					
21	PSITTACIFORMES	PSITTACIDAE	Forpus	conspicillatus	<i>Forpus conspicillatus</i>	x	x	x	x	x	x	x	x		x					
22			Amazona	(ochrocephala) ochrocephala	<i>Amazona ochrocephala</i>				x											
23	CUCULIFORMES	CUCULIDAE	Piaya	cayana	<i>Piaya cayana</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24			Crotophaga	ani	<i>Crotophaga ani</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
25			Crotophaga	sulcirostris	<i>Crotophaga sulcirostris</i>				x				x							
26			Tapera	naevia	<i>Tapera naevia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27			Coccyzus	americanus	<i>Coccyzus americanus</i>				x				x							
28	CAPRIMULGIFORMES	CAPRIMULGIDAE	Nyctidromus	albicollis	<i>Nyctidromus albicollis</i>				x	x										
29			Caprimulgus	longirostris	<i>Caprimulgus longirostris</i>					x										
30		STEATORNITHIDAE	Steatornis	caripensis	<i>Steatornis caripensis</i>			x												
31	APODIFORMES	APODIDAE	Streptoprocne	zonaris	<i>Streptoprocne zonaris</i>	x	x		x	x		x	x	x	x	x				
32			Aeronautes	montivagus	<i>Aeronautes montivagus</i>	x	x	x	x	x		x	x	x	x					x
33		TROCHILIDAE	Amazilia	tzacatl	<i>Amazilia tzacatl</i>	x		x		x	x	x	x	x	x	x	x			
34			Amazilia	castaneiventris	<i>Amazilia castaneiventris</i>	x			x					x	x	x	x	x		x
35			Amazilia	cyanifrons	<i>Amazilia cyanifrons</i>	x		x		x	x	x	x	x	x	x			x	x
36			Amazilia	saucerrottei	<i>Amazilia saucerrottei</i>													x	x	
37			Chlorostilbon	gibsoni	<i>Chlorostilbon gibsoni</i>	x	x		x	x			x	x						
38	APODIFORMES	TROCHILIDAE	Anthracothorax	nigricollis	<i>Anthracothorax nigricollis</i>	x	x	x		x				x	x					
39			Chlorostilbon	mellisugus	<i>Chlorostilbon mellisugus</i>			x			x	x								
40			Phaethornis	(superciliosus) superciliosus	<i>Phaethornis superciliosus</i>					x										
41			Chrysolampis	mosquitus	<i>Chrysolampis mosquitus</i>					x										
42			Phaethornis	guy	<i>Phaethornis guy</i>					x			x							
43			Campylopterus	falcatus	<i>Campylopterus falcatus</i>									x		x				x

N°	Orden	Familia	Genero	Especie	Taxon	GUA	BUT	HOY	LAG	AGU	BOS	OTE	BEL	SIA	ESP	RAF	COS	LOM	MES	GUY
44	APODIFORMES	TROCHILIDAE	Chlorostilbon	poortmanni	<i>Chlorostilbon poortmanni</i>											X			X	X
45			Colibri	coruscans	<i>Colibri coruscans</i>											X		X	X	
46			Metallura	tyrianthina	<i>Metallura tyrianthina</i>											X				
47			Acestrura	mulsant	<i>Acestrura mulsant</i>														X	
48			Heliangelus	amethysticollis	<i>Heliangelus amethysticollis</i>											X				
49	CORACIIFORMES	ALCEDINIDAE	Chloroceryle	americana	<i>Chloroceryle americana</i>			X		X										
50	CORACIIFORMES	MOMOTIDAE	Momotus	(momota) momota	<i>Momotus momota</i>	X	X		X	X			X							
51	PICIFORMES	BUCCONIDAE	Malacoptila	mystacalis	<i>Malacoptila mystacalis</i>					X										
52		PICIDAE	Picumnus	olivaceus	<i>Picumnus olivaceus</i>	X	X	X		X			X	X						
53			Melanerpes	rubricapillus	<i>Melanerpes rubricapillus</i>	X	X	X	X	X	X	X	X	X	X		X			
54			Veniliornis	kirikii	<i>Veniliornis kirikii</i>	X							X							
55			Colaptes	punctigula	<i>Colaptes punctigula</i>			X	X	X			X		X	X			X	X
56	PASSERIFORMES	DENDROCOLAPTIDAE	Xiphorhynchus	picus	<i>Xiphorhynchus picus</i>	X	X			X			X		X					
57			Campylorhamphus	trochilirostris	<i>Campylorhamphus trochilirostris</i>				X	X										
58			Lepidocolaptes	affinis	<i>Lepidocolaptes affinis</i>											X				
59		FURNARIIDAE	Synallaxis	albescens	<i>Synallaxis albescens</i>	X	X		X	X	X	X	X		X	X	X	X	X	X
60			Synallaxis	(azarae) elegantior	<i>Synallaxis elegantior</i>									X						
61			Synallaxis	subpudica	<i>Synallaxis subpudica</i>											X				
62		FORMICARIIDAE	Thamnophilus	multistriatus	<i>Thamnophilus multistriatus</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63			Formicivora	grisea	<i>Formicivora grisea</i>		X		X	X			X		X					
64		FORMICARIIDAE	Dysithamnus	mentalis	<i>Dysithamnus mentalis</i>								X							
65			Grallaria	(ruficapilla) ruficapilla	<i>Grallaria ruficapilla</i>											X				
66		TYRANNIDAE	Pachyramphus	albogriseus	<i>Pachyramphus albogriseus</i>					X			X		X					
67			Pachyramphus	rufus	<i>Pachyramphus rufus</i>								X							
68			Myiophobus	fasciatus	<i>Myiophobus fasciatus</i>			X												
69			Myiophobus	flavicans	<i>Myiophobus flavicans</i>											X				
70			Zimmerius	(viridiflavus) chrysops	<i>Zimmerius chrysops</i>			X			X	X		X						
71			Pyrocephalus	rubinus	<i>Pyrocephalus rubinus</i>	X	X	X	X	X	X	X	X	X	X	X		X	X	
72			Euscarthmus	meloryphus	<i>Euscarthmus meloryphus</i>	X	X		X				X		X					
73			Myiozetetes	cayanensis	<i>Myiozetetes cayanensis</i>	X	X	X		X	X		X							
74			Myiodynastes	(maculatus) maculatus	<i>Myiodynastes maculatus</i>	X			X	X	X	X	X							
75			Tyrannus	melancholicus	<i>Tyrannus melancholicus</i>	X	X	X	X	X	X	X	X	X	X	X		X	X	X
76			Pitangus	sulphuratus	<i>Pitangus sulphuratus</i>	X	X	X	X	X	X	X	X	X	X	X	X	X		
77			Elaenia	flavogaster	<i>Elaenia flavogaster</i>	X	X	X	X	X	X	X	X	X						
78			Elaenia	frantzii	<i>Elaenia frantzii</i>				X		X	X				X			X	
79			Elaenia	chiriquensis	<i>Elaenia chiriquensis</i>									X				X		
80			Sayornis	nigricans	<i>Sayornis nigricans</i>			X	X	X		X	X	X						
81			Todirostrum	cinereum	<i>Todirostrum cinereum</i>	X				X			X	X						
82			Hemitriccus	margaritaceiventris	<i>Hemitriccus margaritaceiventris</i>	X	X	X	X	X			X		X					
83			Myiarchus	tyrannulus	<i>Myiarchus tyrannulus</i>	X	X		X	X	X	X	X		X					
84			Myiarchus	apicalis	<i>Myiarchus apicalis</i>	X	X		X	X		X	X		X	X		X		
85			Leptopogon	superciliaris	<i>Leptopogon superciliaris</i>	X	X													
86			Machetornis	rixosus	<i>Machetornis rixosus</i>				X				X							

N°	Orden	Familia	Genero	Especie	Taxon	GUA	BUT	HOY	LAG	AGU	BOS	OTE	BEL	SIA	ESP	RAF	COS	LOM	MES	GUY
87	PASSERIFORMES	TYRANNIDAE	Legatus	leucophaeus	<i>Legatus leucophaeus</i>					x			x							
88			Camptostoma	obsoletum	<i>Camptostoma obsoletum</i>				x	x										
89			Tolmomyias	sulphurescens	<i>Tolmomyias sulphurescens</i>	x	x	x		x			x	x			x			
90			Serpophaga	cinerea	<i>Serpophaga cinerea</i>								x	x						
91			Contopus	cinereus	<i>Contopus cinereus</i>								x	x						
92			Contopus	fumigatus	<i>Contopus fumigatus</i>											x				
93			Mecocerculus	leucophrys	<i>Mecocerculus leucophrys</i>											x				
94		HIRUNDINIDAE	Stelgidopteryx	ruficollis	<i>Stelgidopteryx ruficollis</i>	x	x	x		x	x		x	x	x					
95			Phaeoprogne	tapera	<i>Phaeoprogne tapera</i>			x						x						
96			Notiochelidon	cyanoleuca	<i>Notiochelidon cyanoleuca</i>	x							x							
97			Progne	chalybea	<i>Progne chalybea</i>					x			x							
98			Hirundo	rustica	<i>Hirundo rustica</i>											x				
99		CORVIDAE	Cyanocorax	yncas	<i>Cyanocorax yncas</i>					x										
100		TROGLODYTIDAE	Campylorhynchus	griseus	<i>Campylorhynchus griseus</i>	x	x		x	x	x	x	x	x	x	x	x	x	x	x
101			Thryothorus	nicefori	<i>Thryothorus nicefori</i>	x	x			x			x		x		x	x	x	x
102			Thryothorus	(genibarbis) mystacalis	<i>Thryothorus mystacalis</i>			x												
103			Troglodytes	(aedon) aedon	<i>Troglodytes aedon</i>	x	x	x	x	x	x	x	x	x	x	x				
104			Henicorhina	leucophrys	<i>Henicorhina leucophrys</i>								x							
105		MIMIDAE	Mimus	gilvus	<i>Mimus gilvus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
106		TURDINAE	Catharus	ustulatus	<i>Catharus ustulatus</i>	x	x		x	x	x	x	x							
107			Catharus	aurantiiostris	<i>Catharus aurantiostris</i>								x							x
108			Turdus	leucomelas	<i>Turdus leucomelas</i>	x				x			x							
109			Turdus	ignobilis	<i>Turdus ignobilis</i>	x	x	x	x	x	x		x	x		x	x			x
110			Turdus	fuscater	<i>Turdus fuscater</i>								x		x					
111		ICTERIDAE	Sturnella	magna	<i>Sturnella magna</i>			x				x	x	x		x				x
112			Sturnella	militaris	<i>Sturnella militaris</i>			x												
113			Icterus	chrysater	<i>Icterus chrysater</i>	x	x	x	x	x	x	x	x	x	x		x	x	x	x
114			Icterus	nigrogularis	<i>Icterus nigrogularis</i>			x								x				
115			Icterus	icterus	<i>Icterus icterus</i>				x											
116			Molothrus	bonariensis	<i>Molothrus bonariensis</i>			x		x								x		x
117			Cacicus	(leucoramphus) leucoramphus	<i>Cacicus leucoramphus</i>											x				
118		VIREONIDAE	Cyclarhis	gujanensis	<i>Cyclarhis gujanensis</i>	x	x	x		x					x					
119			Vireo	(olivaceus) olivaceus	<i>Vireo olivaceus</i>	x	x			x	x		x							
120			Vireo	leucophrys	<i>Vireo leucophrys</i>	x		x		x			x	x						
121			Hylophilus	flavipes	<i>Hylophilus flavipes</i>	x	x	x	x	x			x	x	x					
122		PARULINAE	Parula	pitiayumi	<i>Parula pitiayumi</i>	x	x	x	x	x	x	x	x		x	x		x	x	x
123			Dendroica	striata	<i>Dendroica striata</i>	x				x	x	x	x			x	x			
124			Dendroica	fusca	<i>Dendroica fusca</i>	x	x		x	x	x	x	x							
125			Dendroica	(petechia) petechia	<i>Dendroica petechia</i>											x				
126			Vermivora	peregrina	<i>Vermivora peregrina</i>											x				
127			Vermivora	chrysoptera	<i>Vermivora chrysoptera</i>	x														
128			Seiurus	noveboracensis	<i>Seiurus noveboracensis</i>	x	x			x			x							
129			Basileuterus	rufifrons	<i>Basileuterus rufifrons</i>	x	x			x			x							

N°	Orden	Familia	Genero	Especie	Taxon	GUA	BUT	HOY	LAG	AGU	BOS	OTE	BEL	SIA	ESP	RAF	COS	LOM	MES	GUY
130	PASSERIFORMES	PARULINAE	Basileuterus	culicivorus	<i>Basileuterus culicivorus</i>			x		x	x	x		x						x
131			Phaeothlypis	fulvicauda	<i>Phaeothlypis fulvicauda</i>					x							x			
132			Basileuterus	tristriatus	<i>Basileuterus tristriatus</i>	x				x			x	x						
133			Basileuterus	conspicillatus	<i>Basileuterus conspicillatus</i>											x				
134			Protonotaria	citrea	<i>Protonotaria citrea</i>								x							
135			Oporornis	philadelphia	<i>Oporornis philadelphia</i>								x							
136			Coereba	flaveola	<i>Coereba flaveola</i>	x	x	x			x		x	x						
137	PASSERIFORMES	THRAUPINAE	Tachyphonus	rufus	<i>Tachyphonus rufus</i>	x	x	x		x	x		x	x	x					
138			Tangara	guttata	<i>Tangara guttata</i>			x			x				x					
139			Ramphocelus	dimidiatus	<i>Ramphocelus dimidiatus</i>	x	x	x	x	x	x	x	x	x						
140			Tangara	cyanicollis	<i>Tangara cyanicollis</i>	x		x		x	x	x	x	x						
141			Tangara	heinei	<i>Tangara heinei</i>						x			x						
142			Tangara	vitriolina	<i>Tangara vitriolina</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
143			Euphonia	laniirostris	<i>Euphonia laniirostris</i>	x	x	x	x	x	x		x	x	x	x	x			x
144			Thraupis	episcopus	<i>Thraupis episcopus</i>	x	x	x	x	x	x	x	x	x	x	x				x
145			Thraupis	cyanocephala	<i>Thraupis cyanocephala</i>											x				
146			Thraupis	palmarum	<i>Thraupis palmarum</i>	x	x	x	x	x	x		x		x			x		
147			Piranga	rubra	<i>Piranga rubra</i>	x	x		x		x	x	x			x				
148			Piranga	olivacea	<i>Piranga olivacea</i>								x							
149			Piranga	flava	<i>Piranga flava</i>														x	x
150			Anisognathus	igniventris	<i>Anisognathus igniventris</i>											x				
151			Diglossa	cyanea	<i>Diglossa cyanea</i>											x				
152			Diglossa	albilatera	<i>Diglossa albilatera</i>											x				
153			Pipraeidea	melanonota	<i>Pipraeidea melanonota</i>											x				
154			Hemispingus	frontalis	<i>Hemispingus frontalis</i>											x				
155		FRINGILLIDAE	Carduelis	psaltria	<i>Carduelis psaltria</i>	x	x	x		x	x		x	x	x	x		x		
156		EMBERIZINAE	Volatinia	jacarina	<i>Volatinia jacarina</i>	x	x	x		x	x		x	x	x	x	x	x		
157			Sicalis	flaveola	<i>Sicalis flaveola</i>	x	x	x		x	x		x	x						
158			Tiaris	bicolor	<i>Tiaris bicolor</i>	x	x		x	x	x		x		x					
159			Tiaris	olivacea	<i>Tiaris olivacea</i>					x		x	x	x			x	x		x
160			Arremon	schlegeli	<i>Arremon schlegeli</i>		x			x			x		x					
161			Sporophila	nigricollis	<i>Sporophila nigricollis</i>	x	x	x	x	x	x	x	x		x	x		x	x	
162			Sporophila	minuta	<i>Sporophila minuta</i>											x	x			
163			Zonotrichia	capensis	<i>Zonotrichia capensis</i>			x		x	x	x		x		x			x	
164			Atlapetes	albofrenatus	<i>Atlapetes albofrenatus</i>							x								
165		CARDINALINAE	Saltator	coerulescens	<i>Saltator coerulescens</i>					x							x			
166			Saltator	albicollis	<i>Saltator albicollis</i>	x	x	x		x	x	x	x		x	x	x	x	x	x
167			Pheucticus	ludovicianus	<i>Pheucticus ludovicianus</i>						x									
168			Pheucticus	aureoventris	<i>Pheucticus aureoventris</i>											x				

DISCUSSION

We present a list of the birds and new registers gathered in the Chicamocha Valley. 168 species were reported from 15 spots, some of which are endemic or migratory. New registries were obtained about the two critically endangered endemic species, *Thryothorus nicefori* and *Amazilia castaneiventris*. Besides, there are new distribution ranges for 3 species, *Geranoaetus melanoleucus*, *Chondrohierax uncinatus* and *Icterus icterus*. These facts were used to designate the dry forest of the Chicamocha Canyon as an Important Bird Area (Franco y Bravo, 2005).

Right now there is no legal protection figure in Colombia that safeguards this canyon's ecosystems, which are really endangered because of goat cattle raising and agricultural practices, being the causes of dramatic erosion. This ecosystem loss makes a serious negative impact on the evolutionary processes of the endemic species that inhabit these ecosystems.

During camp field work we observed the phenomena of fragmentation and desertification that are being experienced by these dry areas. There are few deciduous forest patches because it is being used to build fences and as wood for fires. It is imperative to protect this ecosystem, now that it is the most threatened one in Colombia and maybe in the world, and it provides shelter for several endemic animal and plant species.

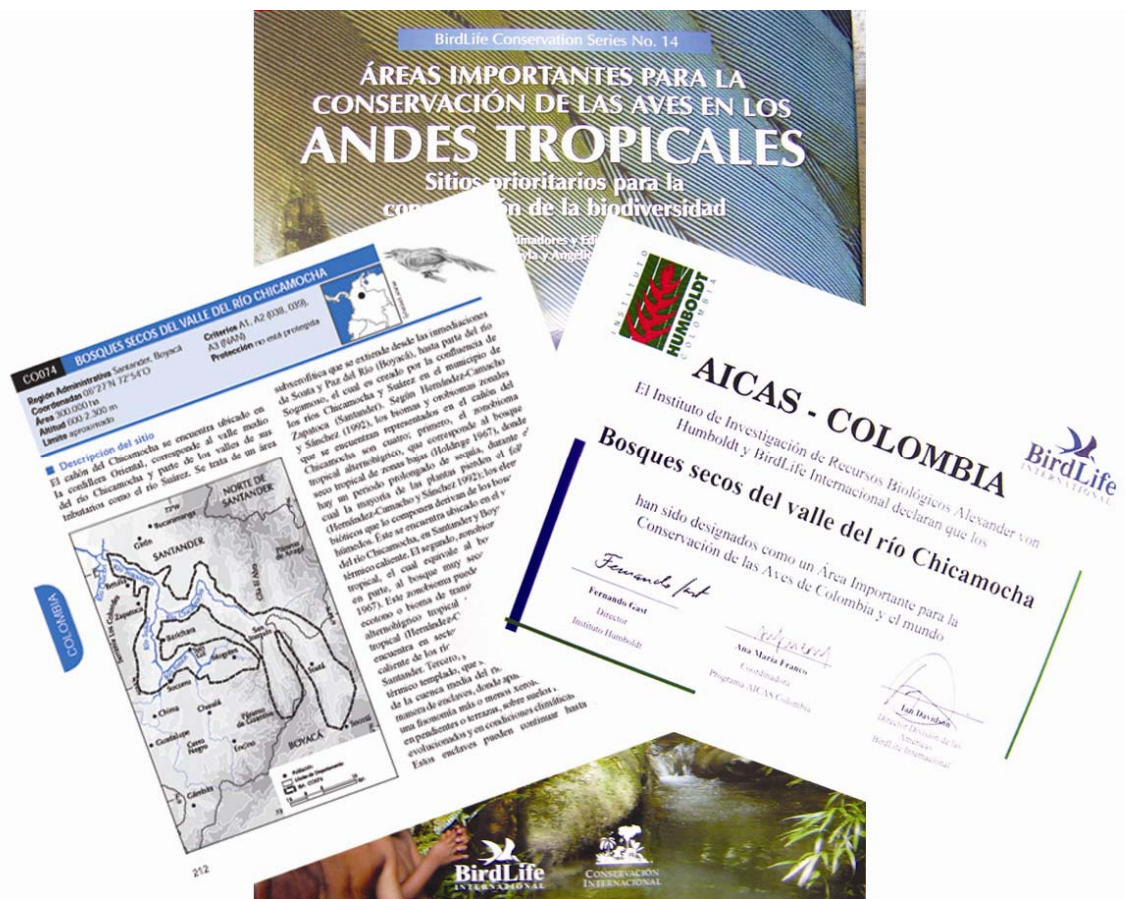
We recommend the declaration of a new natural reserve in this area by the environmental authorities, which can protect its fauna and flora. Of all the spots we sampled in the Chicamocha Valley region, we can assure that Hacienda Laguneta, in Zapatoca, Santander (LAG, Fig. 1), is the best conserved. This place has a good representation of dry forest, but has a lot of pressure from the extensive goat cattle raising activity. The spots where the dry forest patches are located in Hacienda Laguneta are useful to connect the riverine woods of the Sogamoso river basin with the Andean cloud forests located in the Serranía de los Yariquíes. Besides, these dry forests are in contact with wet forests of the Magdalena mid river basin, which can possibly create a "ecotono" that has not been studied at the moment. This is why the dry forests of Hacienda Laguneta should be conserved, in order to give continuity to the ecological and evolutionary processes that are still being held in the area.

Finally, we are sure that the environmental education processes that we started in the region should continue, because the people that inhabit this zone need to be conscious about the importance of protecting the biodiversity that is around them and about their role as its keepers.

It is imperative that the local environmental authorities cooperate and enhance these preservation efforts by supporting and carrying out research about these topics, along with designing laws and commandments to control and decrease anthropogenic impacts that contribute to biodiversity loss.

6. Important Bird Area (IBA): Dry Forests of Chicamocha River Valley

Project Chicamocha designated the dry forests of Chicamocha river valley as Important Bird Area (IBA) of Colombia and world. The appointment is due to the presence of two species of birds Niceforo's wren (*Thryothorus nicefori*) and chestnut-bellied hummingbird (*Amazilia castaneiventris*), both critically endangered species, endemic to the dry valleys of the Eastern Cordillera. Also, five endemic species and subspecies have been reported in the area: (*Ortalis (motmot) colombiana*, *Momotus momota olivaresii*, *Myiarchus apicalis*, *Campylorhynchus griseus bicolor*, *Arremon schlegeli canidorsum*). The area has approximately 300.000 hectares between 600 - 2.300 meters of altitude and comprises two administrative regions Boyacá and Santander. Finally, the Chicamocha river valley is not a protected area and these need conservation actions because there are phenomena of fragmentation and desertification that are being experienced by these dry areas (Franco y Bravo. 2005).



7. Educational campaign



Introduction

Educational activities and dissemination of the information with the local community are crucial for the long-term success of the conservation efforts of the Niceforo's wren and the Chestnut-bellied hummingbird and their habitats. About nine local schools were visited by our team researchers and nearly 387 children students participated in the educational workshops. In every Municipality we contact the local radio station where we disseminated our conservation message. In addition 1000 posters regarding the conservation of the threatened bird of the Chicamocha valley including Niceforo's wren and Chestnut-bellied hummingbird were distributed throughout the region.

Objectives

Our principal aim was to create knowledge and environmental awareness about the bird species present in the area and their habitats and requirements.

Methods

We carried out three principal activities:

1. Educational workshops with students at local schools.

In all the municipios where fieldwork was conducted, every school was visited for two days. During these visits educational workshops with the children was complete. Origami and painting workshops were made with the children. In addition conservation workshops were made with the more advanced 5th grade kids. Once the educational activities completed, we evaluated the children knowledge about threatened birds to verify our labor adequacy.

2. Dissemination of information on the local radio stations and local newspapers.

In all the municipios we made contact with the local radios and newspaper to increase diffusion of the species and our conservation activities throughout the region.

3. Distribution of the poster of the threatened birds of the Chicamocha valley.

The poster from the Niceforo's wren and Chestnut-bellied hummingbird and other endemic species from the Chicamocha valley were delivered through the Municipals.

Results

- **Educational workshops with students at local schools.**

In every school we visited we introduced Chicamocha Project and then we talk about animal extinction and bird threatened species: Niceforo's wren and Chestnut-bellied hummingbird. We motivated children to share their opinions and try to aware them of the problem. Then we promote educational activities like painting and origami focusing primary on both Niceforo's wren and Chestnut-bellied hummingbird threatened species as well on other animal species and its habitats (Figs 1, 2, 3). Normally children show interest during the activities and were concerned on conservation understanding. During the project a total of 387 children from nine schools in seven Veredas were visited (Figure 4).



Figure 1. Origami workshops. The students besides paint and make their own origami parrot, wrote a conservation message.



Figure 2. Workshops include creatively activities, like painting local bird species.



Figure 3. Local schools children painting threatened birds.

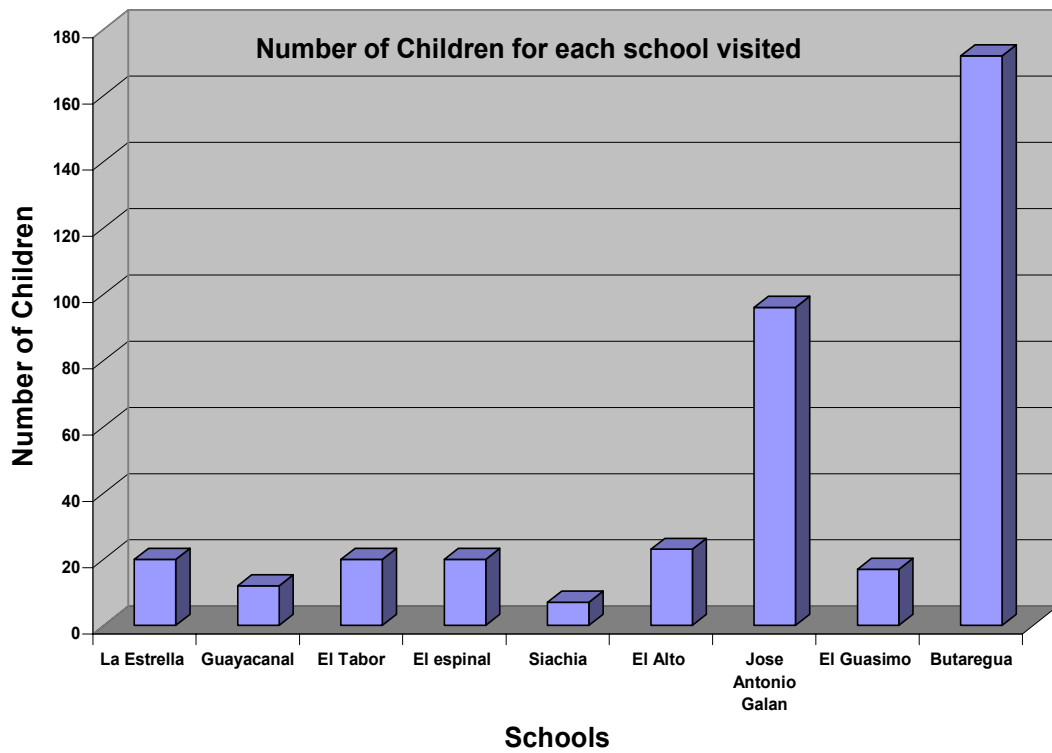


Figure 4. Number of Children whom participated in educational activities in nine schools at departamento de Santander and Boyacá.

- Booklet, "The inhabitants of the dry forest", given to the children of the visited schools (Fig. 5 and 6).

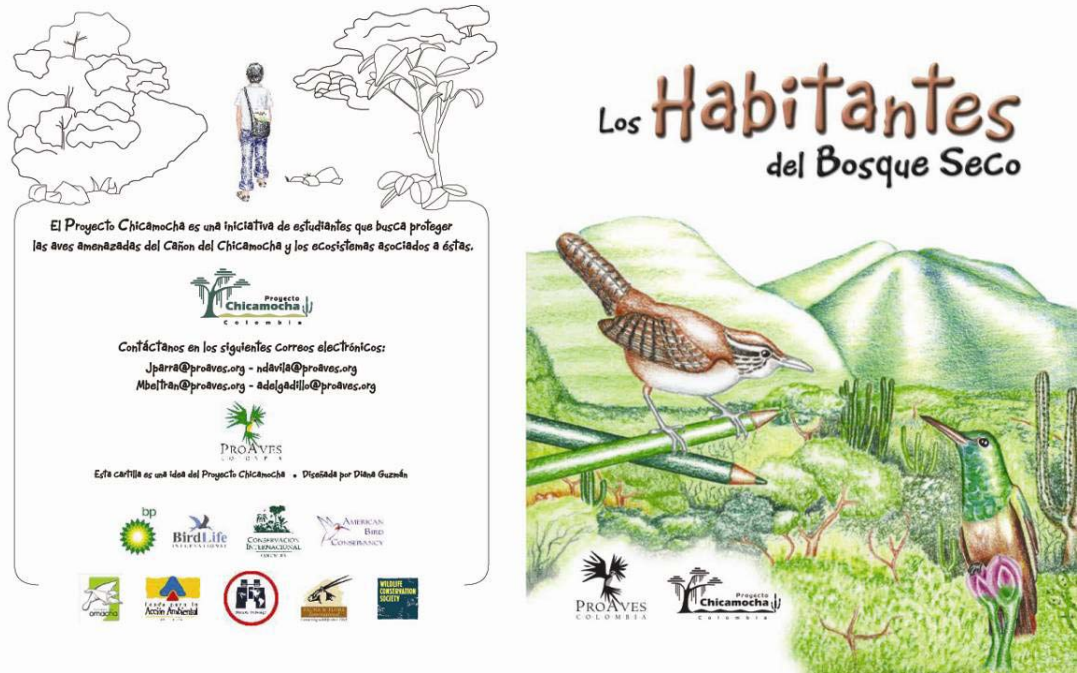


Figure 5. Booklet



Figure 6. Children with booklet "Los habitantes del bosque seco".

8. Diffusion of results

- **Dissemination of information on the local radio stations and local newspapers.**

Local community was informed about the project aims through radio stations, newspapers and television news. Five radio stations were visited: RCN and Caracol (Municipio of San Gil), La Cometa radio (Municipio of Mogotes), Radio Galán (Municipio of Galan) (Fig 1, 2). Tele San Gil television news and two newspapers, Vanguardia Liberal (Fig 3) and El Tiempo informed about Chicamocha project.



Figure 1. Caracol Radio interview at San Gil city.



Figure 2. La Cometa Radio Interview at municipio of Mogotes.

El escarabajo, Orlando Rodríguez Villar

Estas dos aves están en vía de extinción

Estudian al cucarachero y al colibrí

SAN GIL

Expedición Chicamocha, es el nombre del proyecto que adelantan en la región un grupo de biólogos de la Fundación ProAves, con el apoyo de varias organizaciones nacionales e internacionales, y que busca crear conciencia sobre la conservación de las especies, pero especialmente la del Cucarachero de Niceforo y el Colibrí ventricastaño.

Estas son dos especies de pajaritos que habitan en San Gil y las provincias guantánama y comútera, y en general las cuencas de los ríos Chicamocha, Suárez y Fonce, y que según han detectado los investigadores Jorge Enrique Parra Bastos y Marcela Beltrán Tolosa, ya están inscritos en la lista de especies en vía de extinción.

Los cucaracheros de Niceforo, llamados así por su descubridor el sacerdote lasallista, Niceforo María, son pequeñas aves que viven en los matorrales espinosos y se alimentan de insectos (gusanillos y otros), en tanto que el colibrí ventricastaño, que recibió este nombre por el color de su vientre, es el visitante permanente de los jardines y árboles que florecen, y lógicamente se alimentan con su polen, dicen los biólogos.

El trabajo consiste en visitar distintos lugares para detectar estas dos aves, y con ello poder actualizar el mapa de distribución de las mismas.

Igualmente, en las veredas y pueblos, donde se detectan, los biólogos llegan hasta las escuelas más cercanas para dialogar con los niños, padres de familia, profesores y habitantes del sector en general, sobre la necesidad de conservar estas especies, y las demás.

Señalan que la importancia de contribuir a la conservación de especies como éstas radica en que ellas están manteniendo un ciclo ecológico dentro de un ecosistema.

El cucarachero que se alimenta de insectos que están dentro de la hojarasca, ayuda a controlar las plagas, mientras que el colibrí va polinizando las flores y esto hace que las mismas se fertilicen y nazcan los frutos que reproducen nuevas plantas.

Añaden que se ha descubierto que, contrario a lo que podría pensarse, que las aves las extinguen los niños con las caucheras, las causas por las cuales se ha reducido la población de cucaracheros y colibríes, son la tala de bosques, las quemas y en general la expansión de la frontera agrícola, acciones que los relegan y hacen que cada vez para ellos sea más difícil encontrar su alimento.

En las charlas a las comunidades se insiste sobre todos estos temas y sobre la manera de mantener un hábitat favorable a estas inofensivas aves.

En el programa están colaborando la Alcaldía de San Gil y demás de la región, el parque El Gallineral (donde vive una importante población de las dos especies), las corporaciones autóctonas de Santander (Cias) y de Boyacá (Corpoboyacá), las umatías y las comunidades.

Foto: Fundación ProAves/Vanguardia Liberal

A LA IZQUIERDA el cucarachero de Niceforo o común, y a la derecha el colibrí ventricastaño, dos de las pequeñas aves que habitan en la provincia guantánama, pero que empiezan a ser consideradas en vía de extinción por la tala y las quemas. Por esto un grupo de biólogos (foto inferior), llegó a la región para estudiarlas y concientizar sobre su conservación.

expansión de la frontera agrícola, acciones que los relegan y hacen que cada vez para ellos sea más difícil encontrar su alimento.

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El cuento concluye hoy

Figure 3. Diffusion at the Vanguardia Liberal newspaper. San Gil city.

- **Distribution of the poster of the threatened birds of the Chicamocha valley.**

We designed a poster to promote scientific knowledge about some threatened birds of the dry forest of the Chicamocha river basin and the need of urgent conservation actions. This poster illustrates Niceforo's wren and Chestnut-bellied hummingbird and other endemic species from the Chicamocha valley. We delivered about 1000 posters in the region to local people and schools (Fig. 4).



Figure 4. Poster designed to promote community awareness about threatened birds of the Chicamocha valley.

- Results have been available on the project web site (Fig. 5).
http://www.proaves.org/rubrique.php?id_rubrique=30



Figure 5. Web site Project Chicamocha.

- On the first Congreso de Ornitología Colombiana (Santa Marta, Colombia) we present a Poster preliminary project results (Fig. 6).



Figure 6. Poster presented at I Congreso de Ornitología Colombiana (Santa Marta 2004).

- We participated in the regional planification process for the **Corredor de Conservación Guantiva - La Rusia – Iguaque**. The region of Chicamocha canyon is found whitin de Corredor (Fig 7).

<http://www.corredordeconservacion.org/index.php?doc=pagina.php&paginasId=59&catId=121&ubcatId=>

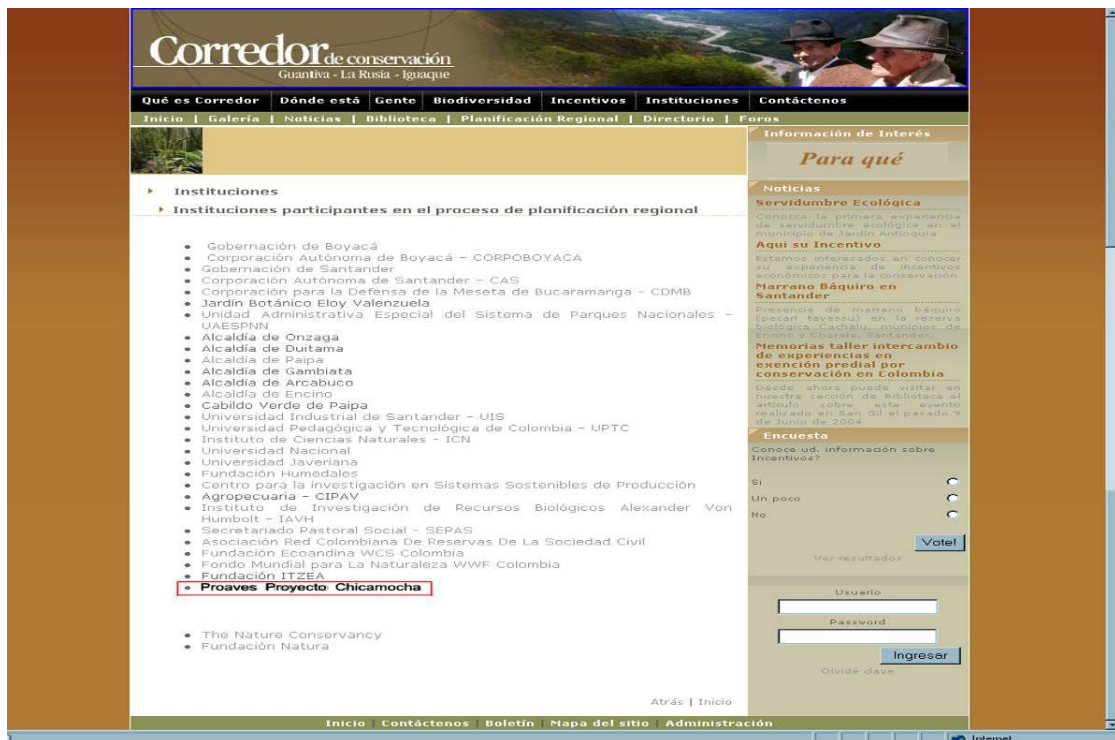


Figure 7. Web site Corredor de conservación Guantiva – La Rusia – Iguaque.

9. Recommendations for Future Conservation Action

For the long-term conservation of the Niceforo's wren and the Chestnut-bellied hummingbird and its remaining habitat we suggest the following actions based on the results of the Chicamocha project.

The following actions are suggested:

1. It is necessary to obtain more records of Niceforo's wren populations to obtain new data and make comparisons.
2. It is necessary to increase the research period to other seasons in the year to cover the dry and rainy seasons and to obtain new data on nesting, territories and vocalizations.
3. It is necessary to prolong the monitoring of the Niceforo's wren and the Chestnut-bellied hummingbird populations. Also is very important to continue with studies that can improve the information about its biology.
4. Increase the conservation awareness for the protection of the remaining dry forest fragments around the San Gil city. An area that we believe is outstanding in the preservation of some Niceforo's wren populations. (Fig.1)
5. There must be a specially consideration on shadow coffee plantations that are considered a habitat for residents and migratory bird species, and that are also important areas for the Niceforo's wren and the Chestnut-bellied hummingbird populations.
6. Begin studies on other taxonomic groups of fauna and flora endemic to the Chicamocha valley to identify its conservation status.
7. To continue with the biodiversity studies in this area, carrying out inventories, monitoring and conservation activities.

8. We strongly recommend the protection and creation of a protected area in the Finca Lagunetas in the municipality of Zapatoca (department of Santander) (Figure 2). This area is one of the better conserved dry forest areas along the Chicamocha valley, and would require immediately protection.



Figure 1. Dry forest fragments in the mountains of San Gil city. These remnants of vegetation are important habitats for Niceforo's wren individuals.

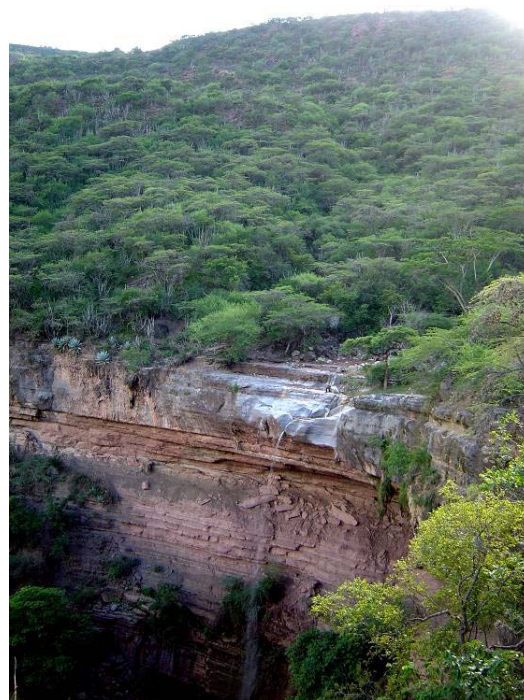


Figure 2. The Dry forest at Finca Lagunetas (Zapatoca, Santander).

9. For the long term of the conservation efforts it is of main importance continuing with educational activities within the local communities. During the project we worked with local schools children and it is critical to continue with this thought. However we think that also the implementations of educational activities with the adult local community will be necessary to obtain the tools necessary to counteract the habitat destruction (Fig. 3).
10. Conformed local research groups that could help in the conservation efforts in the Chicamocha area.
11. Develop sustainable productive projects with the local community.
12. Carry out a vegetation study to determine if it is possible to apply a forestation program. If possible put into practice botany nurseries like native plant suppliers.



Figure 3. Local students having an educational workshop.



A



B

Figure 4. A. Dry forest remnants at Galan town next to the Suarez river. B. Chicamocha river. Confluence of the Chicamocha and Suarez rivers which form the Sogamoso river.

10. Acknowledgements

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