Assessment of conservation status of the newly rediscovered Southern Horned Curassow and associated biodiversity in Peru
Final Report.

July – December 2006.

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General Project Sumary

This year 2006, thanks to the BP conservation program and The Sweden Club 300 support, we returned to the Sira Mountains to continue studying the Peruvian Horned Curassow (*Pauxi unicornis koepckeae*). We wanted to know find out more about this beautiful and almost unknown species and its habitat. We also conducted bird and mammal surveys to find out what other important conservation species occur in this wonderful place.

During this year's work we heard 5 Peruvian Horned Curassow singing in two of the three studied areas, which represents a minimum of four breading territories. The Peruvian Horned Curassow's song is totally different to the Bolivian Horned Curassow and is more similar to the Venezuelan one, and this suggests that the two taxa in Peru and Bolivia are two different species. We also found three sets of feathers in different places in Sira Mountains; which should allow us to make a genetic analysis to confirm that the Peruvian taxon is a completely different species than the Bolivian taxon. In addition, one member of the team saw one individual of the species and recorded it on video which will help us to confirm the morphological differences between both subspecies.

In this study we also registered 215 bird species in total in the Sira Mountains. These included the Sira Tanager (*Tangara phillipsi)* which is endemic to the Sira mountain range, Koepcke's Hermit (*Phaetornis koepckeae)* a Peruvian endemic, the globally threatened Black Tinamou (*Tinamous osgoodii),* the restricted range Cerulean Manakin (*Pipra coeruleocapilla)* and 42 new bird records for the area such as: Sub-tropical Pygmy Owl (*Glaucidium parkeri),* Buckley's Forest-Falcon (*Micrastur buckleyi).* For mammals, we registered a total of 25 species, including the following species of conservation concern: Jaguar (*Panthera onca*), Andean Bear *(Tremarctos ornatus*), and Tapir *(Tapirus terrestris).* We also collected plants to make the first Peruvian Horned Curassow's habitat description.

We are happy with our results but we know that much more can be done in the Sira Mountains, especially to help protection and conservation of the area, and thus protect all endemic and important conservation species in this area. In the future, we would also like to get sound recordings of the Peruvian Southern Curassow to finish the species differentiation.

Project Objetives

a. Conduct field studies to locate and estimate the size of the surviving Peruvian Southern Horned Curassow population. Determine its conservation requirements and vulnerability to human encroachment.
b. Obtain a series of sound recordings and behavioural observations to be used in combination with the known physical differences to determine if the Peruvian taxon is a unique species.
c. Carry out an assessment of the importance of the Sira mountains in central Peru for other threatened bird, mammal and plant biodiversity, including the first botanical description of the curassow's habitat.
d. Work with El Sira Communal Reserve - INRENA (the protected areas authority) to investigate the feasibility of creating a private reserve in the area the Curassow has been found, which is outside the area protected by the main reserve.

Study Area

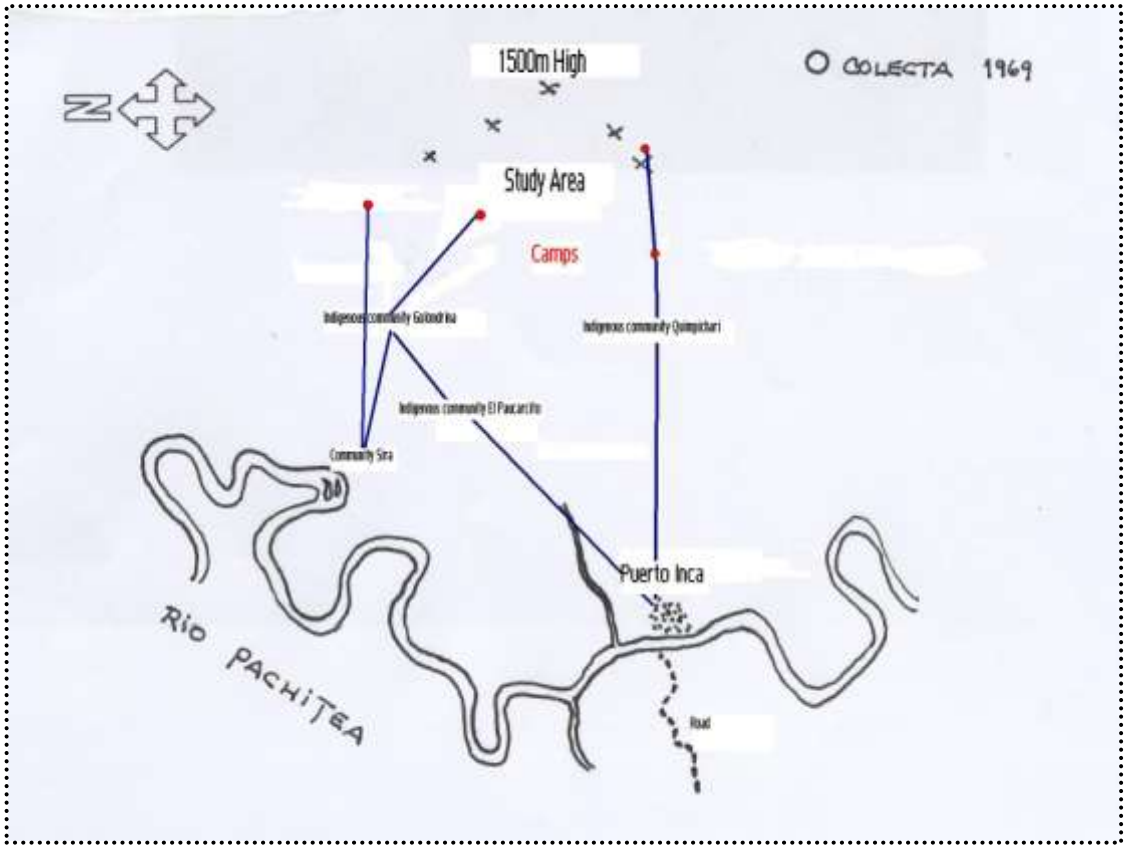
The Sira Mountains are located in central Peru, in the political department of Huanuco. These mountains are isolated from the Andes and they hold many species of animals, plants and insects which are endemic to the area. This area is included in the Peruvian East Andean Foothills Endemic Bird Area (EBA 053) (Stattersfield et al. 1998) and therefore has a high global conservation priority. It belongs to the Communal Reserve of Sira but this provides no real protection from human disturbance because it is not working properly, and there are no laws in the country that protect all flora and fauna in the area.

The first project phase began on the 5th of July and finished on the 20th of August of 2006, dry season in Sira Mountains. And the second project phase was carried out between the 1st of October and the 16th of November of 2006; this is the start of the wet season in the area. We started the fieldwork from Puerto Inca visiting three different sites in the Sira Mountains. The first site called **Casa Real** was located near the village of Sira. The second site was located near to the indigenous community of Golondrina, so we call this place **Golondrina**. The third place is located near the indigenous community Quimpichari, so we call the third place **Quimpichari**.

Camp	Coordinates	Altitude	Nº days Phase 1	Nº days Phase 2
Casa Real	S 09º 18.801' W 074º 48.379'	1035m.	0	8
Golondrina	S 09º 20.206' W 074º 49.304'	730m.	14	11
Quimpichari 1	S 09º 23.130' W 074º 48.235'	700m.	5	2
Quimpichari 2	S 09º 22.956' W 074º 47.303'	1170m.	9	11

Table 1. Study sites coordinates.

In red, The Sira Mountains study area.



In blue, the route we followed

The Sira Mountains

Photo by: M. Gastañaga

Photo by: T. Boza

Peruvian Horned Curassow's Report

Melvin Gastañaga Corvacho

1. Introduction

Cracids are a bird family that lives only in the Americas, from Southern Texas to Northern Argentina. Many cracids species are threatened by human activities; particularly hunting which has caused them to disappear from many places. The Cracidae family contains three groups: the curassows, guans and chachalacas, and in Peru there are five globally threatened species: Peruvian Southern Horned Curassow, Wattled Curassow, Bearded Guan, White-wing Guan, and Rufous-headed Chachalaca.

The Peruvian Horned Curassow was uplisted to Endangered in 2005 by BirdLife International. In the fall of 2003, Armonia (BirdLife partner in Bolivia) began the Southern Horned Curassow project completing a local information survey in Peru supported initially by Chicago Zoological Society and Sweden Club 300 (see Gastañaga, M. y A. B. Hennessey. 2005). I travelled to the Communal Reserve El Sira to seek local information on the species that had been recorded once in 1969 (two collected specimens) but could not be found during an ornithological expedition in 2000. Twenty-five local indigenous people around the isolated Cerro de El Sira described in detail the first records of the species in the country for 34 years. Some people reported that they had hunted the species recently.

The most recent local studies have shown that what we once thought was a species found all along the Peruvian/Bolivian Andean mountain cloud forest chain, would appear to be two isolated populations found on the outer limits with a gap of over 1000 km between them.

In 2005 we saw a Peruvian Horned Curassow alive in the wild (the first such observation ever made by scientists) and heard three more singing which was the first report of the specie in Peru since 1969. In the same year when we went back to the area we saw another two individuals and recorded one on video. This year we aimed to collect information about the species, estimate its population density in the breeding season and make some observations of its behaviour. There are no previous studies of this species and no information on how many there are in Sira Mountains.

2. Methodology

In each study site we carried out the search for the Southern Horned Curassow at the same time we were conducting the bird survey, from approximately 06.00 hrs. to 17.00 hrs. every day during the field work. Also all team members from the mammal and botanical groups report any encounters they had with the species. At each site we used recently opened trails and already exiting trails as transects that covered the complete range of micro habitats in the area.

The curassow survey used line transects for mapping the possible territories of the species in the area. These transects were carried out walking along 8 trails in the three study sites and repeating each transects at least three times to ensure territories had a high chance of being detected. During the project we used two video cameras for recording any visual registrations of the species in the field. We also had sound recording equipment (Sharp Minidisk MT280E recorder with a Sennheiser ME 66 shotgun style directional microphone) available in the hope of recording the species song.

When we detected any individual we registered the following in a data sheet: date, time, altitude, individual's location, distance from the observer, number of individuals, heard or observed (if it was observed we described the plumage and other morphological characteristics), age, sex, what the individual was doing and if we got any sound recording or video.

3. Results.

In the first project phase we visited two study sites: Golondrina and Quimpichari, we heard one curassow singing briefly on two days in Golondrina (we are pretty sure that it was the same individual because the some came from the same area and the next day from the first one). At Quimpichari we heard five times two curassows singing briefly (from two different locations).

In the second project phase we visited all three study sites: Casa Real, Golondrina and Quimpichari. No curassows were found at the Casa Real or Golondrina sites suggesting there is no breeding population in these areas. In Quimpichari we heard Southern Horned Curassows singing 10 times and by combing records in the same location and at the same altitude we calculated there were four different males of the species singing along our transects. From previous information about cracids in captivity (Owen Joiner comm. Per.) and experience in Bolivia we know that only males of the Pauxi genus sing to delimitated territories and to attract females so we concluded that the songs we heard represent a minimum of four breeding territories.

Line transects in Quimpichari covert a total of 2.4 Km., and we estimated that we could hear the curassows singing up to 100m away. From this data we

estimated the survey area cover by transects to be 0.48 Km^2. and calculated the species density to be 8.3 singing individuals per Km^2.

Additionally we found three sets of tail feathers from Southern Horned Curassow in different places suggest that they belonged to different individuals. Also one team member observed one individual of the species when he came back from his transect on the 5th of November 2006 at 14.41hrs. at approximately 1360m, and record 9 minutes of video showing morphological characteristics and behaviour in the field (see photos below).

The species was found between 1150m and 1450m in cloud forest in Sira Mountains. This contrasts with the Bolivian subspecies that occurs in humid forest on the edge of the tropical lowlands and in montane forest between 400 – 1200m in the Bolivian yungas.

The Peruvian Horned Curassow in the field on 05/11/2006.

Photo by: J. Mendoza

4. Discussion

In this study we estimated for the first time the Peruvian Southern Horned Curassow's breeding density to be 8 singing individuals per Km^2 and this similar to the average estimation of the Bolivian Southern Horned Curassow's density in its breading season (10 singing individuals per Km^2 - MacLeod *et al* 2000).

With the feathers of the three different individuals we found in Quimpichari and Golondrina we hope to be able to make a genetic analysis and separate the Peruvian and Bolivian subspecies into two separate species. This would increase the conservation importance of both populations because each species would have many less individuals than we thought.

The video recording we got this year, with the 2005 video recording and with the original specimen will also be used to make the species description, as they provide evidence of consistent morphological differences between the Peruvian and Bolivian taxa further suggesting that they are two different species. The main morphological differences between the subspecies are: in the Peruvian taxon the crest is flattened close to the head and its colour is a bluish grey, the white tip to the tail is narrow and the sheen to the black body plumage is blue. In the Bolivian taxon the crest is like a horn vertically orientated and blue in colour, the white tip in the tail is wider and the plumage sheen is green (See photos bellow).

Peruvian taxon

Photo by: J. Mendoza

Bolivian taxon

Photo by: R. MacLeod

The final evidence that suggest that these two taxa are different species is the song; in two taxa the song is totally different. The Peruvian taxon songs consist of a phrase of four notes that are repeated approximately every four or five seconds. The Bolivian taxon song consists of four phrases of a total of eight notes that are repeated every 15 seconds and also has a very distinctive final note that *P. u. koepckeae* does not have.

Unfortunately we were not able to record the Peruvian Horned Curassow song because of heavy rains and strong winds during most of the field work. We will therefore aim to get this recording on future visits in order to help publish the description of *Pauxi unicornis koepckeae* as a new species. We also would like to continue working with the species in the area and getting know more about its behaviour, feeding, ecology, etc. to identify its conservation requirements.

Head photos comparing three individuals from genus Pauxi

Peru

Photo by: J. Mendoza

Bolivia

Photo by: M. Gastañaga

Venezuela

Photo by: M. Gastañaga

The main threat to the species is hunting by the local communities. The Horned Curassow is legally protected in the Cerro de El Sira Reserve, but no education or formal protection infrastructure has been established. We have previously conducting some environmental education with some local communities so now they know this curassow is endangered and have promised to help us to protect it. But recently we have also heard about one being hunted by one of the members of the community with whom we have worked. This means to us that even when there are some people who really care there are others who still don't mind if this bird disappears for ever. So we still have lots to do to protect this threatened bird and it remains in need of urgent protection.

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Ornithological Report

Melvin Gastañaga Corvacho and Ross MacLeod.

This report describes the findings of the ornithological inventory work carried in the Sira Mountains, Huanuco Department, in central Peru, between July and November 2006.

1. Methodology

Systematic inventories of the birds present at the survey sites (see Table 2) in the NW part of the Sira Mountains were conducted using visual and audio identification. In the field, identification was based on the plates from standard field guides, including The Birds of South America Volumes 1 & 2 (Ridgely & Tudor 1989, 1994), A Field Guide to the Birds of Peru (Clements & Shany 2001), The Birds of Ecuador (Ridgely & Greenfield 2001) and Birds of Colombia (Hilty & Brown 1995). Audio identification was based on the CD sound guides, Voices of Amazonian Birds Volumes 1, 2 & 3 (Schulenberg et al. 2000) and Voices of Andean Birds Volumes 1 & 2 (Schulenberg 2000). Visual identifications were made using binoculars and supported by field notes, sketches and photographic evidence. Audio identification was based on extensive use of sound recording and play back techniques (Parker 1991). On return from the field an extensive collection of ornithological reference works was accessible to confirm difficult visual and audio identifications.

At each location a mixture of newly cut trails, existing paths, and dry riverbeds were used as transects to cover the complete range of microhabitats at each site. Every individual bird detected, either visually or audibly, was registered while walking along these transects. Inventory work began before first light (which in Sira was normally between 0520 and 0610 hrs, depending on season, location and weather) with sound recording of the dawn chorus. Work normally continued through the morning until between 1200hrs and 1700hrs with exact starting and stopping times depending on bird activity and weather. Night time transects and/or timed night point counts were also conducted at each site for nocturnal and crepuscular species, such as owls and nightjars. Each night transect or point count lasted 30 minutes, was carried out between 1800hrs and 2100hrs and only one was conducted in any night. During the transect or count each species that sang or called was registered. The work was conducted by two observers working together as a single survey team, each observer used 8x binoculars for visual identification and a set of sound recording equipment (a Sharp Minidisk MT280E recorder with a Sennheiser ME 66 shotgun style directional microphone) was used to back up audio identification. The survey site details and survey effort at each site is described in Table 2.

Table 2 – Bird inventory survey effort and site information. The inventory dates are the first and last survey days at each site and work days gives the number of days on which inventory data was actually collected and takes account of interruptions by weather etc.

Inventory Site	Coordinates & Inventory Dates	Altitudinal Range	Work Days Phase 1	Work Days Phase 2
Casa Real	S 09º 18.801' W 074º 48.379' 7 to 12 October 2006	920 - 1200m.	0	6
Golondrina	S 09º 20.206' W 074º 49.304' 15 to 26 July 2006 18 to 25 October 2006	700 - 1225m.	10	7
Quimpichari 1	S 09º 23.130' W 074º 48.235' 2 to 6 August 2006 9 November 2006	700 - 1150m.	5	1
Quimpichari 2	S 09º 22.956' W 074º 47.303' 7 to 12 August 2006 31st Oct. to 8th Nov. 2006	1150 - 1500m.	6	7

2. Results

A total of 215 species (see Table 4) were registered within the study area which covered an altitudinal range of 700m to 1500m. The 42 species (20%) marked in bold in Table 4 are new distributional records for species that have not been recorded in the Sira mountains previously (Terborgh 1975, Mee et al. 2002). This total does not include incidental records of species encountered at lower altitudes and in secondary habitats when entering and leaving the area. The study area contained two major habitat types; in the montane forest (between 700 and 1150m) we registered 129 species, while in the cloud forest between (1150 and 1500m) we registered 135 species. A total of 13 species of special conservation concern were identified in the Sira Mountains, these included 2 globally threatened species, the endangered Southern Horned Curassow *Pauxi unicornis*, the vulnerable Black Tinamou *Tinamus osgoodi*, 4 near-threatened species and 9 Peruvian endemics, all of which are shown in Table 3.

Table 3 – Species of special conservation concern. (MF=Found in Montane forest, CF= Found in Cloud Forest & 1= present)

Species	English Name	Conservation Status	MF	CF
Tinamus osgoodi	Black Tinamou	Vulnerable		1
Pauxi unicornis	Southern Horned Curassow	Endangered		1
Phaethornis koepckeae	Koepcke's Hermit	Endemic Near-threatened	1	1
Heliodoxa branickii	Rufous-webbed Brilliant	Endemic	1	1
Eriocnemis sapphiropygia	Coppery-naped Puffleg	Endemic	1	
Herpsilochmus motacilloides	Creamy-bellied Antwren	Endemic		1
Pipreola chlorolepidota	Fiery-throated Fruiteater	Near-Threatened		1
Lepidothrix coeruleocapilla	Cerulean-capped Manakin	Endemic	1	1
Zimmerius viridiflavus	Peruvian Tyrannulet	Endemic		1
Hemitriccus rufigularis	Buff-throated Tody-Tyrant	Near-Threatened		1
Cinnycerthia peruana	Peruvian Wren	Endemic	1	
Basileuterus chrysogaster	Golden-bellied Warbler	Endemic	1	1
Tangara phillipsi	Sira Manager	Endemic Near-threatened		1

Table 4 indicates the evidence for the presence of each species. Vocal activity was surprisingly low during much of the study period and this is reflected in the fact that 93% of species were identified visually compared to only 43% identified by their vocalizations. Work on the sound recordings made during the study is ongoing but so far we have recordings from 54 species (25%) and video or photographic evidence for 18 (8%).

3. Discussion & Conclusions

The Sira Mountains are of major importance to global bird conservation. First because they are the only known home to a unique population of the Southern Horned Curassow which this project has shown differs morphologically, behaviourally, in habitat preference and in altitudinal range from the Bolivian population of this taxon. Second because they hold a substantial population of the vulnerable Black Tinamou which we detected frequently. Third because it holds a suite of species whose global distributions are restricted to the Peruvian East Andean Foothills Endemic Bird Area (EBA053), are Peruvian Endemics and or are near-threatened. Of special importance is the Sira Tanager *Tangara phillipsi* which like *Pauxi unicornis koepckeae* is endemic to the cloud forests of Sira.

Black-tailed Trogon - *Trogon melanurus*, from Sira Lowlands

Male Photo by: R. MacLeod

Female Photo by: R. MacLeod

Table 4 – Bird Species registered in the Sira Mountains, with information on habitat use and evidence for presence. MF=Species present in montane forest, CF=Species present in cloud forest, V=visual identification, A=audio identification, R=sound recording evidence, Ph=photo or video evidence, 1 = present, 0 = absent. Species marked in bold are new records for Sira.

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
TINAMIFORMES: Tinamidae		5						
Gray Tinamou	*Tinamus tao*	1	1	0	1	1	1	0
Black Tinamou	*Tinamus osgoodi*	1	0	1	1	1	1	0
Little Tinamou	*Crypturellus soui*	1	1	1	0	1	0	0
Brown Tinamou	*Crypturellus obsoletus*	1	0	1	0	1	1	0
Bartlett's Tinamou	*Crypturellus bartletti*	1	1	0	0	1	0	0
FALCONIFORMES: Cathartidae		4						
Black Vulture	*Coragyps atratus*	1	1	0	1	0	0	0
Turkey Vulture	*Cathartes aura*	1	1	0	1	0	0	0
Greater Yellow-headed Vulture	*Cathartes melambrotus*	1	1	0	1	0	0	0
King Vulture	*Sarcoramphus papa*	1	1	0	1	0	0	0
FALCONIFORMES: Accipitridae		3						
Swallow-tailed Kite	*Elanoides forficatus*	1	1	0	1	1	0	0
Double-toothed Kite	*Harpagus bidentatus*	1	1	0	1	0	0	0
Plumbeous Kite	*Ictinia plumbea*	1	1	0	1	0	0	0
FALCONIFORMES: Falconidae		4						
Black Caracara	*Daptrius ater*	1	1	0	1	1	1	0
Red-throated Caracara	*Ibycter americanus*	1	1	1	1	1	1	0
Slaty-backed Forest-Falcon	***Micrastur mirandollei***	**1**	**1**	**1**	**0**	**1**	**1**	**0**
Buckley's Forest-Falcon	***Micrastur buckleyi***	**1**	**1**	**0**	**0**	**1**	**1**	**0**
GALLIFORMES: Cracidae		4						
Spix's Guan	*Penelope jacquacu*	1	0	1	1	1	0	0
Blue-throated Piping-Guan	*Pipile cumanensis*	1	0	0	0	1	0	0
Razor-billed Curassow	*Mitu tuberosa*	1	1	0	1	1	0	0
Southern Horned Curassow	*Pauxi unicornis*	1	0	1	1	1	0	1
GALLIFORMES: Odontophoridae		1						
Rufous-breasted Wood-Quail	*Odontophorus speciosus*	1	0	1	1	1	0	0
COLUMBIFORMES: Columbidae		3						
Plumbeous Pigeon	*Patagioenas plumbea*	1	1	1	1	1	1	0
White-throated Quail-Dove	*Geotrygon frenata*	1	1	1	1	0	0	0
Ruddy Quail-Dove	*Geotrygon montana*	1	0	1	1	0	0	0
PSITTACIFORMES: Psittacidae		1						
Painted Parakeet	*Pyrrhura picta*	1	1	1	1	1	1	0
CUCULIFORMES: Cuculidae		2						

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Gray-capped Cuckoo	***Coccyzus lansbergi***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Squirrel Cuckoo	*Piaya cayana*	1	0	1	1	1	0	0
STRIGIFORMES: Strigidae		6						
Tawny-bellied Screech-Owl	*Megascops watsonii*	1	1	0	0	1	0	0
Rio Napo Screech-Owl	***Megascops napensis***	**1**	**1**	**1**	**0**	**1**	**1**	**0**
Spectacled Owl	*Pulsatrix perspicillata*	1	1	0	0	1	?	0
Band-bellied Owl	***Pulsatrix melanota***	**1**	**1**	**1**	**0**	**1**	**1**	**0**
Subtropical Pygmy-Owl	***Glaucidium parkeri***	**1**	**0**	**1**	**0**	**1**	**1**	**0**
Ferruginous Pygmy-Owl	*Glaucidium brasilianum*	1	1	1	0	1	1	0
CAPRIMULGIFORMES: Nyctibiidae		1						
Common Potoo	*Nyctibius griseus*	1	1	1	0	1	1	0
APODIFORMES: Apodidae		2						
White-collared Swift	*Streptoprocne zonaris*	1	1	0	1	1	1	0
White-tipped Swift	***Aeronautas montivagus***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
TROCHILIFORMES: Trochilidae		25						
Pale-tailed Barbthroat	*Threnetes niger*	1	1	0	1	1	1	0
Green Hermit	*Phaethornis guy*	1	1	0	1	0	0	0
White-bearded Hermit	*Phaethornis hispidus*	1	0	1	1	0	0	0
Western Long-tailed Hermit	***Phaethornis longirostris***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Great-billed Hermit	*Phaethornis malaris*	1	1	0	1	0	0	0
Tawny-bellied Hermit	*Phaethornis syrmatophorus*	1	1	0	1	1	0	0
Koepcke's Hermit	*Phaethornis koepckeae*	1	1	1	1	1	1	0
Needle-billed Hermit	*Phaethornis philippii*	1	0	1	1	0	0	0
Straight-billed Hermit	*Phaethornis bourcieri*	1	0	1	1	0	0	0
Reddish Hermit	***Phaethornis ruber***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Green-fronted Lancebill	*Doryfera ludovicae*	1	1	1	1	1	0	1
Blue-fronted Lancebill	*Doryfera johannae*	1	1	1	1	1	1	1
Gray-breasted Sabrewing	***Campylopterus largipennis***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
White-necked Jacobin	*Florisuga mellivora*	1	1	0	1	0	0	0
Brown Violet-ear	*Colibri delphinae*	1	0	1	1	1	0	1
Green Violet-ear	*Colibri thalassinus*	1	0	1	1	0	0	0
Fork-tailed Woodnymph	*Thalurania furcata*	1	1	1	1	1	0	0
Speckled Hummingbird	*Adelomyia melanogenys*	1	0	1	1	0	0	0
Violet-fronted Brilliant	*Heliodoxa leadbeateri*	1	0	1	1	1	1	1
Black-throated Brilliant	***Heliodoxa schreibersii***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Rufous-webbed Brilliant	*Heliodoxa branickii*	1	1	1	1	0	0	0
Bronzy Inca	*Coeligena coeligena*	1	0	1	1	0	0	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Collared Inca	***Coeligena torquata***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Coppery-naped Puffleg	***Eriocnemis sapphiropygia***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Buff-thighed Puffleg	***Haplophaedia assimilis***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
TROGONIFORMES: Trogonidae		4						
White-tailed Trogon	*Trogon viridis*	1	1	0	1	1	0	1
Collared Trogon	*Trogon collaris*	1	1	1	1	1	1	1
Black-throated Trogon	***Trogon rufus***	**1**	**1**	**0**	**1**	**0**	**0**	**1**
Goleen-headed Quetzal	*Pharomachrus auriceps*	1	1	0	1	0	0	0
CORACIIFORMES: Momotidae		1						
Highland Motmot	***Momotus aequatorialis***	**1**	**0**	**1**	**1**	**1**	**0**	**0**
PICIFORMES: Galbulidae		1						
Great Jacamar	***Jacamerops aureus***	**1**	**1**	**0**	**1**	**1**	**0**	**1**
PICIFORMES: Capitonidae		3						
Gilded Barbet	***Capito auratus***	**1**	**1**	**1**	**1**	**1**	**1**	**0**
Lemon-throated Barbet	*Eubucco richardsoni*	1	1	0	1	0	0	0
Versicolored Barbet	*Eubucco versicolor*	1	0	1	1	0	0	0
PICIFORMES: Ramphastidae		7						
Chestnut-tipped Toucanet	*Aulacorhynchus derbianus*	1	0	1	1	0	0	0
Blue-banded Toucanet	***Aulacorhynchus coeruleicinctis***	**1**	**0**	**1**	**1**	**1**	**0**	**0**
Ivory-billed Aracari	*Pteroglossus azara*	1	1	0	1	1	0	0
Curl-crested Aracari	*Pteroglossus beauharnaesii*	1	1	0	1	1	0	0
Goleen-collared Toucanet	*Selenidera reinwardtii*	1	1	1	1	1	1	1
Channel-billed Toucan	*Ramphastos vitellinus*	1	1	0	1	1	0	0
Red-billed Toucan	*Ramphastos tucanus*	1	1	0	1	1	1	0
PICIFORMES: Picidae		6						
Smoky-brown Woodpecker	*Veniliornis fumigatus*	1	0	1	1	0	0	0
Red-stained Woodpecker	*Veniliornis affinis*	1	0	1	1	0	0	0
Golden-green Woodpecker	***Piculus chrysochloros***	**1**	**1**	**0**	**1**	**1**	**0**	**1**
Chestnut Woodpecker	*Celeus elegans*	1	1	0	1	0	0	0
Red-necked Woodpecker	*Campephilus rubricollis*	1	1	0	1	1	0	1
Crimson-crested Woodpecker	*Campephilus melanoleucos*	1	0	1	1	0	0	0
PASSERIFORMES: Furnariidae		10						
Ash-browed Spinetail	*Cranioleuca curtata*	1	0	1	1	1	1	0
Spotted Barbtail	*Premnoplex brunnescens*	1	0	1	1	1	1	0
Pearled Treerunner	*Margarornis squamiger*	1	0	1	1	0	0	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Plain Xenops	*Xenops minutus*	1	1	0	1	0	0	0
Streaked Xenops	*Xenops rutilans*	1	0	1	1	0	0	0
Montane Foliage-gleaner	***Anabacerthia striaticollis***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Striped Treehunter	***Thripadectes holostictus***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Chestnut-winged Hookbill	*Ancistrops strigilatus*	1	1	0	1	0	0	0
Buff-fronted Foliage-gleaner	*Philydor rufus*	1	1	1	1	1	1	0
Tawny-throated Leaftosser	*Sclerurus mexicanus*	1	1	1	1	1	1	0
PASSERIFORMES: Dendrocolaptidae		9						
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*	1	1	1	1	1	0	0
Long-tailed Woodcreeper	*Deconychura longicauda*	1	1	0	1	0	0	0
Olivaceous Woodcreeper	*Sittasomus griseicapillus*	1	1	1	1	1	0	0
Wedge-billed Woodcreeper	*Glyphorynchus spirurus*	1	1	0	1	1	0	0
Amazonian Barred-Woodcreeper	*Dendrocolaptes certhia*	1	1	0	1	0	0	0
Black-banded Woodcreeper	*Dendrocolaptes picumnus*	1	1	1	1	1	0	0
Ocellated Woodcreeper	*Xiphorhynchus ocellatus*	1	1	1	1	1	0	0
Buff-throated Woodcreeper	*Xiphorhynchus guttatus*	1	1	1	1	1	1	0
Red-billed Scythebill	*Campylorhamphus trochilirostris*	1	1	0	1	0	0	0
PASSERIFORMES: Thamnophilidae		12						
Fasciated Antshrike	*Cymbilaimus lineatus*	1	1	0	1	0	0	0
White-shouldered Antshrike	*Thamnophilus aethiops*	1	1	0	1	1	0	0
Plain-winged Antshrike	*Thamnophilus schistaceus*	1	1	0	1	0	0	0
Mouse-colored Antshrike	*Thamnophilus murinus*	1	1	1	1	0	0	0
Plain Antvireo	*Dysithamnus mentalis*	1	1	1	1	1	1	0
Pygmy Antwren	*Myrmotherula brachyura*	1	1	0	1	0	0	0
Slaty Antwren	*Myrmotherula schisticolor*	1	0	1	1	0	0	0
Rio Suno Antwren	***Myrmotherula sunensis***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Creamy-bellied Antwren	*Herpsilochmus motacilloides*	1	0	1	1	1	1	0
Black-faced Antbird	*Myrmoborus myotherinus*	1	0	1	1	1	0	0
Spot-winged Antbird	***Percnostola leucostigma***	**1**	**1**	**0**	**1**	**1**	**1**	**0**
White-plumed Antbird	*Pithys albifrons*	1	1	0	1	1	1	0
PASSERIFORMES: Formicariidae		3						
Rufous-capped Antthrush	*Formicarius colma*	1	0	1	1	0	0	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Short-tailed Antthrush	*Chamaeza campanisona*	1	0	1	1	1	1	0
Scaled Antpitta	***Grallaria guatimalensis***	**1**	**0**	**1**	**1**	**1**	**1**	**0**
PASSERIFORMES: Conopophagidae		1						
Chestnut-crowned Gnateater	*Conopophaga castaneiceps*	1	1	1	1	1	0	0
PASSERIFORMES: Rhinocryptidae		1						
Rusty-belted Tapaculo	*Liosceles thoracicus*	1	1	0	1	0	0	0
PASSERIFORMES: Cotingidae		6						
Fiery-throated Fruiteater	*Pipreola chlorolepidota*	1	0	1	1	0	0	0
Scarlet-breasted Fruiteater	*Pipreola frontalis*	1	0	1	1	0	0	0
Gray-tailed Piha	***Snowornis subalaris***	**1**	**1**	**1**	**1**	**1**	**1**	**0**
Olivaceous Piha	*Snowornis cryptolophus*	1	0	1	1	0	0	0
Screaming Piha	*Lipaugus vociferans*	1	1	0	1	1	1	0
Andean Cock-of-the-rock	*Rupicola peruviana*	1	1	1	1	1	1	1
PASSERIFORMES: Pipridae		6						
Green Manakin	*Chloropipo holochlora*	1	1	0	1	0	0	0
White-crowned Manakin	*Dixiphia pipra*	1	1	1	1	1	1	0
Blue-crowned Manakin	*Lepidothrix coronata*	1	1	0	1	1	1	0
Round-tailed Manakin	*Pipra chloromeros*	1	1	0	1	1	1	0
Cerulean-capped Manakin	*Lepidothrix coeruleocapilla*	1	1	1	1	1	1	1
Thrush-like Schiffornis	*Schiffornis turdinus*	1	1	1	1	1	1	0
PASSERIFORMES: Tyrannidae		23						
Gray Elaenia	***Myiopagis caniceps***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Yellow-bellied Elaenia	***Elaenia flavogaster***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
White-crested Elaenia	***Elaenia albiceps***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Streak-necked Flycatcher	***Mionectes striaticollis***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Olive-striped Flycatcher	*Mionectes olivaceus*	1	0	1	1	0	0	0
Sepia-capped Flycatcher	***Leptopogon amaurocephalus***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Variegated Bristle-Tyrant	***Pogonotriccus poecilotis***	**1**	**1**	**1**	**1**	**0**	**0**	**0**
Marble-faced Bristle-Tyrant	***Pogonotriccus ophthalmicus***	**1**	**1**	**1**	**1**	**1**	**1**	**0**
Mottle-cheeked Tyrannulet	*Phylloscartes ventralis*	1	0	1	1	0	0	0
Peruvian Tyrannulet	*Zimmerius viridiflavus*	1	0	1	1	0	0	0
White-throated Tyrannulet	***Mecocerculus leucophrys***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
White-eyed Tody-Tyrant	*Hemitriccus zosterops*	1	0	1	1	0	0	0
Buff-throated Tody-Tyrant	*Hemitriccus rufigularis*	1	0	1	1	0	0	0
Yellow-margined Flycatcher	*Tolmomyias assimilis*	1	1	1	1	1	1	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Ornate Flycatcher	*Myiotriccus ornatus*	1	0	1	1	1	1	1
Cinnamon Flycatcher	*Pyrrhomyias cinnamomea*	1	0	1	1	0	0	0
Euler's Flycatcher	*Lathrotriccus euleri*	1	1	0	1	0	0	0
Wood-Pewee species	*Contopus sp*	1	1	1	1	0	0	0
Grayish Mourner	*Rhytipterna simplex*	1	1	1	1	1	1	1
Dusky-capped Flycatcher	*Myiarchus tuberculifer*	1	1	1	0	1	0	0
Pale-edged Flycatcher	*Myiarchus cephalotes*	1	0	1	1	0	0	0
White-winged Becard	***Pachyramphus polychopterus***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Black-capped Becard	*Pachyramphus marginatus*	1	0	1	1	0	0	0
PASSERIFORMES: Troglodytidae		3						
Peruvian Wren	***Cinnycerthia peruana***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Gray-breasted Wood-Wren	*Henicorhina leucophrys*	1	0	1	1	1	1	0
Southern Nightingale-Wren	*Microcerculus marginatus*	1	1	1	1	1	1	0
PASSERIFORMES: Turdidae		4						
Rufous-brown Solitaire	*Cichlopsis leucogenys*	1	0	1	1	0	0	0
Swainson's Thrush	*Catharus ustulatus*	1	1	1	1	0	0	0
Pale-eyed Thrush	*Platycichla leucops*	1	0	0	1	0	0	0
White-necked Thrush	***Turdus albicollis***	**1**	**0**	**0**	**1**	**1**	**0**	**0**
PASSERIFORMES: Corvidae		1						
Green Jay	*Cyanocorax yncas*	1	0	1	1	0	0	0
PASSERIFORMES: Vireonidae		4						
Brown-capped Vireo	***Vireo leucophrys***	**1**	**0**	**0**	**1**	**0**	**0**	**0**
Red-eyed Vireo	*Vireo olivaceus*	1	1	1	1	0	0	0
Tawny-crowned Greenlet	*Hylophilus ochraceiceps*	1	0	1	1	0	0	0
Slaty-capped Shrike-Vireo	*Vireolanius leucotis*	1	1	1	1	0	0	0
PASSERIFORMES: Parulidae		6						
Tropical Parula	*Parula pitiayumi*	1	0	1	1	1	1	0
Blackburnian Warbler	*Dendroica fusca*	1	0	1	1	0	0	0
Canada Warbler	***Wilsonia canadensis***	**1**	**1**	**1**	**1**	**0**	**0**	**0**
Slate-throated Redstart	*Myioborus miniatus*	1	0	1	1	1	0	0
Goleen-bellied Warbler	*Basileuterus chrysogaster*	1	1	1	1	1	1	0
Buff-rumped Warbler	*Basileuterus fulvicauda*	1	1	0	1	0	0	0
PASSERIFORMES: Thraupidae		36						
Magpie Tanager	*Cissopis leveriana*	1	0	0	1	1	0	0
Yellow-throated Bush-Tanager	*Chlorospingus flavigularis*	1	0	1	1	1	0	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Superciliaried Hemispingus	*Hemispingus superciliaris*	1	0	1	1	0	0	0
Oleaginous Hemispingus	*Hemispingus frontalis*	?	0	0	0	0	0	0
Yellow-backed Tanager	*Hemithraupis flavicollis*	1	1	0	1	0	0	0
Olive Tanager	*Chlorothraupis carmioli*	1	1	1	1	1	1	0
White-winged Shrike-Tanager	*Lanio versicolor*	1	1	1	1	0	0	0
Flame-crested Tanager	***Tachyphonus cristatus***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Yellow-crested Tanager	*Tachyphonus rufiventer*	1	1	0	1	0	0	0
Fulvous-crested Tanager	*Tachyphonus surinamus*	1	1	0	1	0	0	0
Black-goggled Tanager	*Trichothraupis melanops*	1	0	1	1	0	0	0
Red-crowned Ant-Tanager	*Habia rubica*	1	1	0	1	0	0	0
Scarlet Tanager	*Piranga olivacea*	1	0	1	1	0	0	0
Summer Tanager	*Piranga rubra*	1	0	1	1	0	0	0
Blue-winged Mountain-Tanager	*Anisognathus somptuosus*	1	0	1	1	0	0	0
Yellow-throated Tanager	*Iridosornis analis*	1	0	1	1	0	0	0
Thick-billed Euphonia	*Euphonia laniirostris*	1	0	1	1	0	0	0
Bronze-green Euphonia	*Euphonia mesochrysa*	1	0	1	1	0	0	0
Orange-bellied Euphonia	*Euphonia xanthogaster*	1	0	1	1	0	0	0
Rufous-bellied Euphonia	*Euphonia rufiventris*	1	1	0	1	0	0	0
Blue-naped Chlorophonia	*Chlorophonia cyanea*	1	1	1	1	0	0	0
Orange-eared Tanager	*Chlorochrysa calliparaea*	1	0	1	1	0	0	0
Paradise Tanager	*Tangara chilensis*	1	1	1	1	1	1	0
Green-and-gold Tanager	*Tangara schrankii*	1	1	1	1	0	0	0
Goleen Tanager	*Tangara arthus*	1	0	1	1	0	0	0
Saffron-crowned Tanager	*Tangara xanthocephala*	1	0	1	1	0	0	0
Spotted Tanager	***Tangara punctata***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Bay-headed Tanager	*Tangara gyrola*	1	1	1	1	0	0	0
Masked Tanager	*Tangara nigrocincta*	1	1	1	1	0	0	0
Black-capped Tanager	***Tangara heinei***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
Sira Manager	*Tangara phillipsi*	1	0	1	1	0	0	0
Black-faced Dacnis	*Dacnis lineata*	1	0	1	1	0	0	0
Yellow-bellied Dacnis	***Dacnis flaviventer***	**1**	**1**	**0**	**1**	**0**	**0**	**0**
Blue Dafnis	*Dacnis cayana*	1	1	1	1	0	0	0
Green Honeycreeper	*Chlorophanes spiza*	1	1	0	1	0	0	0
Purple Honeycreeper	*Cyanerpes caeruleus*	1	1	1	1	0	0	0
Red-legged Honeycreeper	***Cyanerpes cyaneus***	**1**	**0**	**1**	**1**	**0**	**0**	**0**
PASSERIFORMES: Emberizidae		2						
Bluish Flowerpiercer	*Diglossopis caerulescens*	1	0	1	1	0	0	0

English Name	Scientific Name	Sira	Habitat		Evidence			
		List	MF	CF	V	A	R	Ph
Tricolored Brush-Finch	*Atlapetes tricolor*	1	0	1	1	0	0	1
PASSERIFORMES: Cardinalidae		2						
Buff-throated Saltator	*Saltator maximus*	1	1	1	1	0	0	0
Slate-colored Grosbeak	*Saltator grossus*	1	1	1	1	1	1	0
PASSERIFORMES: Icteridae		1						
Russet-backed Oropendola	*Psarocolius angustifrons*	1	1	0	1	1	0	0
Species Totals		**215**	**129**	**135**	**200**	**92**	**54**	**18**
Percentage of Total Species			**60**	**63**	**93**	**43**	**25**	**8**

Greyish Mourner – *Rhytipterna simples*

Photo by: R. MacLeod

4. References

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Mammals Report

Joel Alexander Mendoza Oblitas

1. Methodologies

Direct observation

This was focused in collecting visual and audio data while we were walking in all the trails. This technique was used to confirm mammal species present in the area because this is particularly useful to detect arboreal species, whose ecology means that finding tracks is unlikely. All members of the project team notified the mammal team if mammals were sighted. We used the field guide "Neotropical Rainforest Mammals" (Emmons & Feer 1997) to identify species.

Woolly Monkey (*Lagotrix lagotrichia)*

Photo by: M. Gastañaga

Tracks

Tracks are the most widely used technique to identify terrestrial mammals and to identify big shy mammal species that are rarely seen.

The Fact that mammals are hard to see made it necessary to find specific sites along the trails, like claylick places and mammal trails where the substrate was suitably wet to allow preservation of complete prints.

During this first phase of the Project I made 26 trap tracks. In the second project phase the quantity of trap tracks was diminished because the excessive humidity and heavy rain did not allow us to identify tracks, and therefore they were not useful for registering mammal's species.

Paca Track (*Agouti paca)*

Photo by: J. Mendoza

Jaguar scratch

Photo by: J. Mendoza

Camera Traps

We used six Deercam ©™ scouting traps equipped with Olympus and Deercam 35mm cameras. These were fitted with a 36 exposure 400-speed film, and two 9V batteries. The cameras have an adjustable time delay switch, allowing the camera delay (the time between one photo being taken and the camera allowing further activation) to be set.

The camera traps were positioned based in different criteria, for example possible mammals trails, places where there were lots of tracks or a claylick. The cameras were attached to a tree, usually to the knee high that is perfect to take photos of medium and large mammals (the camera traps location were different for each site depending of the vegetation, habitat and steepness).

Camera Trap positioned in forest

Photo by: M. Gastañaga

2. Results

We identify a total of 25 species for the area we studied in Sira Mountains.

8 species from the order Primates
6 species from the order Carnivora
5 species from the order Rodentia
3 species from the order Artiodactyla
2 species from the order Xenarthra
1 species from the order Perissodactyla.

Tables 5, 6 and 7 shows the numbers of species and individuals registered for each location during the first project phase, and Tables 8, 9 and 10 the species registered on the second project phase. Table 11 shows which methodology was used to identify the species.

Table 12 shows the conservation status of the species we found. We considered two criteria:

The IUCN considers that the Andean Bear (*Tremactos ornatus*) and the Brazilian Tapir (*Tapirus terrestris*) are Vulnerable. And the Jaguar (*Panthera onca*) is Nearly Threatened.

The CITES criteria consider that the Andean Bear (*Tremactos ornatus)*, the Ocelot *(Leopardus pardalis*) and the Jaguar *(Panthera onca)* are included in Appendix I (which includes species endangered by trade). The Saddleback Tamarind Monkey (*Saguinus fuscicollis*), the Night Monkey *(Aotus nigriceps*), the Squirrel Monkey (*Saimiri sciureus*), the White-fronted Capuchin Monkey *(Cebus albifrons)*, the Brown Capuchin Monkey *(Cebus apella)*, the Monk-saki Monkey (*Pithecia monachus*), the Red Howler Monkey (*Alouatta seniculus*), the Woolly Monkey *(Lagothrix lagothricha*), the White-lipped Peccary *(Tayassu pecari)* and the Brazilian Tapir *(Tapirus terrestris*) are included in Appendix II (which includes species that are not threatened, but they would be threatened if people do not regulate these species trade). And the Kinkajou *(Potos flavus*), the South American Coati *(Nasua nasua)* and the Paca (*Agouti paca*) are included in Appendix III (which includes species that are regulated for conservation in some countries).

Table 5. First Project Phase. Species in Golondrina

Nº	English names	Scientific names	Days														Total
			1º	2º	3º	4º	5º	6º	7º	8º	9º	10º	11º	12º	13º	14º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*															
2	Night monkey	*Aotus nigriceps*	1										2			1	**4**
3	Common squirrel monkey	*Saimiri sciureus*	5														**5**
4	White-fronted capuchin monkey	*Cebus albifrons*															
5	Monk saki monkey	*Pithecia monachus*			4							1				3	**8**
6	Red howler monkey	*Alouatta seniculus*															
7	Common woolly monkey	*Lagothrix lagothricha*							2			7	7			6	**22**
8	Andean bear	*Tremarctos ornatos*															
9	South American coati	*Nasua nasua*			6												**6**
10	Jaguar	*Panthera onca*															
11	Red brocket deer	*Mazama americana*															
12	White-lipped peccary	*Tayassu pecari*										1					**1**
13	Collared peccary	*Tayassu tajacu*			6			2									**8**
14	Brazilian tapir	*Tapirus terrestris*			1		1	1				1			2		**6**
15	Southern Amazon red squirrel	*Sciurus spadiceus*							1		1						**2**
16	Bolivian squirrel	*Sciurus ignitus*			1	1			1							2	**5**
17	Bicolor-spined porcupine	*Coendou bicolor*															
18	Paca	*Agouti paca*							1			1			2		**4**
19	Black agouti	*Dasyprocta fuliginosa*					1										**1**

Note: 1º (14th of July of 2006).

Table 6. First Project Phase. Species in Quimpichari – Campament 1

Nº	English names	Scientific names	Days				Total
			1º	2º	3º	4º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*	1				**1**
2	Night monkey	*Aotus nigriceps*					
3	Common squirrel monkey	*Saimiri sciureus*					
4	White-fronted capuchin monkey	*Cebus albifrons*					
5	Monk saki monkey	*Pithecia monachus*					
6	Red howler monkey	*Alouatta seniculus*					
7	Common woolly monkey	*Lagothrix lagothricha*		3	3		**6**
8	Andean bear	*Tremarctos ornatos*					
9	South American coati	*Nasua nasua*					
10	Jaguar	*Panthera onca*	1				**1**
11	Red brocket deer	*Mazama americana*	1				**1**
12	White-lipped peccary	*Tayassu pecari*					
13	Collared peccary	*Tayassu tajacu*			3		**3**
14	Brazilian tapir	*Tapirus terrestris*	1				**1**
15	Southern Amazon red squirrel	*Sciurus spadiceus*				1	**1**
16	Bolivian squirrel	*Sciurus ignitus*		1			**1**
17	Bicolor-spined porcupine	*Coendou bicolor*		1	1		**2**
18	Paca	*Agouti paca*		1	1	2	**4**
19	Black agouti	*Dasyprocta fuliginosa*					

Note: 1º (2nd of August of 2006).

Table 7. First Project Phase. Species in Quimpichari – Campament 2

Nº	English names	Scientific names	Days						Total
			1º	2º	3º	4º	5º	6º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*							
2	Night monkey	*Aotus nigriceps*							
3	Common squirrel monkey	*Saimiri sciureus*							
4	White-fronted capuchin monkey	*Cebus albifrons*			1		1		**2**
5	Monk saki monkey	*Pithecia monachus*							
6	Red howler monkey	*Alouatta seniculus*	1						**1**
7	Common woolly monkey	*Lagothrix lagothricha*			1		12	7	**20**
8	Andean bear	*Tremarctos ornatos*		1			1		**2**
9	South American coati	*Nasua nasua*	6						**6**
10	Jaguar	*Panthera onca*				1			**1**
11	Red brocket deer	*Mazama americana*							
12	White-lipped peccary	*Tayassu pecari*							
13	Collared peccary	*Tayassu tajacu*							
14	Brazilian tapir	*Tapirus terrestris*							
15	Southern Amazon red squirrel	*Sciurus spadiceus*							
16	Bolivian squirrel	*Sciurus ignitus*			1				**1**
17	Bicolor-spined porcupine	*Coendou bicolor*							
18	Paca	*Agouti paca*			1				**1**
19	Black agouti	*Dasyprocta fuliginosa*							

Note: 1º (7th of August of 2006)

Table 8. Second Project Phase. Species in Casa Real

Nº	English names	Scientific names	Days							Total
			1º	2º	3º	4º	5º	6º	7º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*		1	1					**2**
2	Night monkey	*Aotus nigriceps*								
3	Common squirrel monkey	*Saimiri sciureus*								
4	White-fronted capuchin monkey	*Cebus albifrons*								
5	Monk saki monkey	*Pithecia monachus*							5	**5**
6	Red howler monkey	*Alouatta seniculus*								
7	Common woolly monkey	*Lagothrix lagothricha*		3			2	5	10	**20**
8	Andean bear	*Tremarctos ornatos*								
9	Kinkajou	*Potos flavus*	1							**1**
10	South American coati	*Nasua nasua*								
11	Jaguar	*Panthera onca*			1					**1**
12	Red brocket deer	*Mazama americana*								
13	White-lipped peccary	*Tayassu pecari*								
14	Collared peccary	*Tayassu tajacu*		4	1					**5**
15	Brazilian tapir	*Tapirus terrestris*			2					**2**
16	Southern Amazon red squirrel	*Sciurus spadiceus*					1			**1**
17	Bolivian squirrel	*Sciurus ignitus*					1	2		**3**
18	Bicolor-spined porcupine	*Coendou bicolor*	1			2				**3**
19	Paca	*Agouti paca*								
20	Black agouti	*Dasyprocta fuliginosa*								

Note: 1º (6th of October of 2006).

Table 9. Second Project Phase. Species in Golondrina

Nº	English names	Scientific names	Days									Total
			1º	2º	3º	4º	5º	6º	7º	8º	9º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*										
2	Night monkey	*Aotus nigriceps*		2		2	1					**5**
3	Common squirrel monkey	*Saimiri sciureus*										
4	White-fronted capuchin monkey	*Cebus albifrons*								9		**9**
5	Brown capuchin monkey	*Cebus apella*								3		**3**
6	Monk saki monkey	*Pithecia monachus*				6						**6**
7	Red howler monkey	*Alouatta seniculus*		1								**1**
8	Common woolly monkey	*Lagothrix lagothricha*		6		24		2	4	6		**42**
9	Andean bear	*Tremarctos ornatos*										
10	South American coati	*Nasua nasua*										
11	Ocelot	*Leopardus pardalis*						1				**1**
12	Jaguar	*Panthera onca*				1						**1**
13	Red brocket deer	*Mazama americana*	1			2						**2**
14	White-lipped peccary	*Tayassu pecari*										
15	Collared peccary	*Tayassu tajacu*				1						**1**
16	Brazilian tapir	*Tapirus terrestris*				2						**2**
17	Southern Amazon red squirrel	*Sciurus spadiceus*		1								**1**
18	Bolivian squirrel	*Sciurus ignitus*										
19	Bicolor-spined porcupine	*Coendou bicolor*										
20	Paca	*Agouti paca*										
21	Black agouti	*Dasyprocta fuliginosa*						2				**2**

Note: 1º (17th of October of 2006).

Table 10. Second Project Phase. Species in Quimpichari – Campament 2

Nº	English names	Scientific names	Days								Total
			1º	2º	3º	4º	5º	6º	7º	8º	
1	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*									
2	Night monkey	*Aotus nigriceps*				7			5		**12**
3	Common squirrel monkey	*Saimiri sciureus*									**1**
4	White-fronted capuchin monkey	*Cebus albifrons*							1		
5	Monk saki monkey	*Pithecia monachus*							4	2	**6**
6	Red howler monkey	*Alouatta seniculus*									
7	Common woolly monkey	*Lagothrix lagothricha*	8				2				**10**
8	Andean bear	*Tremarctos ornatos*	1								**1**
9	South American coati	*Nasua nasua*									
10	Jaguar	*Panthera onca*	1		1						**2**
11	Red brocket deer	*Mazama americana*									
12	White-lipped peccary	*Tayassu pecari*									
13	Collared peccary	*Tayassu tajacu*									
14	Brazilian tapir	*Tapirus terrestris*	1								**1**
15	Southern Amazon red squirrel	*Sciurus spadiceus*	1							2	**3**
16	Bolivian squirrel	*Sciurus ignitus*					1			1	**2**
17	Bicolor-spined porcupine	*Coendou bicolor*									
18	Paca	*Agouti paca*									
19	Black agouti	*Dasyprocta fuliginosa*									

Note: 1º (1st of November of 2006).

Table 11. Method of identification and species for each location

Nº	English names	Scientific names	Method of identification	Location		
				Casa Real	Golondrina	Quimpichari
1	Southern tamandua (*)	*Tamandua tetradactyla*	V	X		
2	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*	R	X		X
3	Saddleback tamarind (*)	*Saguinus fuscicollis*	V	X		
4	Night monkey	*Aotus nigriceps*	V		X	
5	Common squirrel monkey	*Saimiri sciureus*	V		X	
6	White-fronted capuchin monkey	*Cebus albifrons*	V		X	X
7	Brown capuchin monkey	*Cebus paella*	V		X	
8	Monk saki monkey	*Pithecia monachus*	V,O	X	X	
9	Red howler monkey	*Alouatta seniculus*	O			X
10	Common woolly monkey	*Lagothrix lagothricha*	V,O	X	X	X
11	Andean bear	*Tremarctos ornatus*	R			X
12	Kinkajou	*Potos flavus*	V	X		
13	South American coati	*Nasua nasua*	V		X	X
14	Tayra (*)	*Eira Barbara*	V		X	
15	Ocelot	*Leopardus pardalis*	V		X	
16	Jaguar	*Panthera onca*	R	X		X
17	Red brocket deer	*Mazama americana*	H			X
18	White-lipped peccary	*Tayassu pecari*	H		X	
19	Collared peccary	*Tayassu tajacu*	V,H	X	X	X
20	Brazilian tapir	*Tapirus terrestris*	H,C	X	X	X
21	Southern Amazon red squirrel	*Sciurus spadiceus*	V,O	X	X	X
22	Bolivian squirrel	*Sciurus ignites*	V	X	X	X
23	Bicolor-spined porcupine	*Coendou bicolor*	V,H	X		X
24	Paca	*Agouti paca*	H		X	X
25	Black agouti	*Dasyprocta fuliginosa*	V,H		X	

R: Animal sign (Claw marks, faeces, sleeping places, hairs, etc.), V: sighting, O: heard, H: track, C: camera.
(*) Species seen by the team in previous field work.

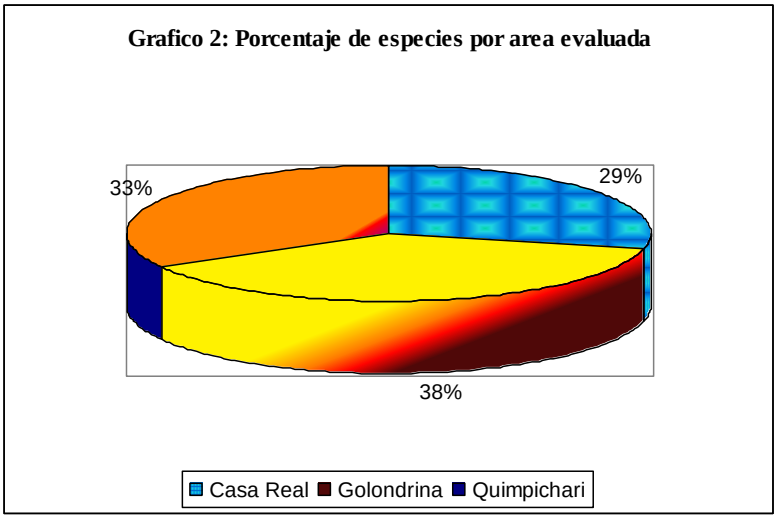
Table 12. Conservation Status of the Species we found

Nº	English names	Scientific names	Conservation Status	
			CITES	UICN
	Xenarthra			
1	Southern tamandua	*Tamandua tetradactyla*		LC
2	Nine-banded long-nosed armadillo	*Dasypus novemcinctus*		LC
	Primates			
3	Saddleback tamarind	*Saguinus fuscicollis*	Appendix II	LC
4	Night monkey	*Aotus nigriceps*	Appendix II	LC
5	Common squirrel monkey	*Saimiri sciureus*	Appendix II	LC
6	White-fronted capuchin monkey	*Cebus albifrons*	Appendix II	LC
7	Brown capuchin monkey	*Cebus apella*	Appendix II	LC
8	Monk saki monkey	*Pithecia monachus*	Appendix II	LC
9	Red howler monkey	*Alouatta seniculus*	Appendix II	LC
10	Common woolly monkey	*Lagothrix lagothricha*	Appendix II	LR/lc
	Carnivora			
11	Andean bear	*Tremarctos ornatus*	Appendix I	VU
12	Kinkajou	*Potos flavus*	Appendix III	LR/lc
13	South American coati	*Nasua nasua*	Appendix III	LR/lc
14	Tayra	*Eira barbara*		LR/lc
15	Ocelot	*Leopardus pardalis*	Appendix I	LC
16	Jaguar	*Panthera onca*	Appendix I	NT
	Artiodactyla			
17	Red brocket deer	*Mazama americana*		DD
18	White-lipped peccary	*Tayassu pecari*	Appendix II	LR/lc
19	Collared peccary	*Tayassu tajacu*		LR/lc
	Perissodactyla			
20	Brazilian tapir	*Tapirus terrestris*	Appendix II	VU
	Rodentia			
21	Southern Amazon red squirrel	*Sciurus spadiceus*		LR/lc
22	Bolivian squirrel	*Sciurus ignitus*		LR/lc
23	Bicolor-spined porcupine	*Coendou bicolor*		LR/lc
24	Paca	*Agouti paca*	Appendix III	LR/lc
25	Black agouti	*Dasyprocta fuliginosa*		LR/lc

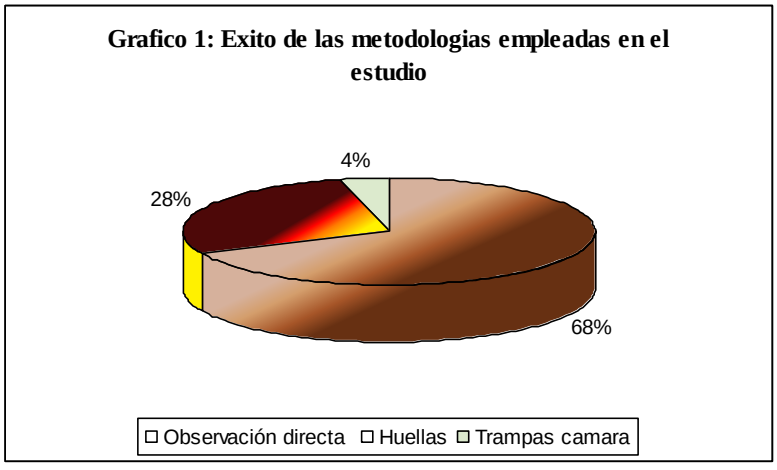
*LC: Least Concern, LR: Low Risk, VU: Vulnerable, NT: Near-threatened, DD: Data Deficient.

3. Conclusions

In our study Golondrina had a larger number of species than other study places. We found 16 species of a total of 25 species registered for the whole study, the results expressed by percentages shows that Golondrina had 38% of the registration.



The more successful methodology for the study was the direct observation. With this methodology we registered 17 species or 68% of the total of species registered with all the methodologies.



From the three study places (Casa Real, Golondrina y Quimpichari) the most commonly detected species was the Woolly Monkey (*Lagothrix lagothrichia)*, and this species also had the highest number of individuals detected.

4. Discussion

The direct observation covers a bigger area in a study, increasing the probability of detecting more animals. Some natural facts like the weather, the availability of food and the species abundance influence the number of animals we observed. Despite of all the potential disadvantages like heavy rains and strong winds reducing detection, this methodology was the most successful of all the methodologies we used for the mammals survey. Using the direct observation we were less likely to detect mammals of low abundance and cryptic habits.

The trap tracks are easy to use in the field and are an alternative that does not require sophisticated equipment to study medium and large size mammals. Using the trap tracks we are able to detect shy and nocturnal species. However, the identification of the tracks some times can be difficult due to the similarities between species tracks.

The cam traps can be located in the forest or open areas and are more likely to sample one area with not too much effort. In previous studies made by Asociacion Armonia in Bolivia, this methodology has shown really good results detecting mammals and cracids. These studies were carried out in the lowlands and the cameras were positioned in open forest floor, which provide good detectability of animals. On the other hand, in Sira Mountains the terrain presented lots of geographical difficulties and there were not big open areas, all of this facts plus the high humidity due to the heavy rains during the study were a big negative influence on the effectiveness of this methodology in Sira.

5. References

1. CITES – Convention on International Trade in Endangered Species of Wild Fauna and Flora. www.cites.org
2. IUCN – The world conservation union. www.iucn.org – 2006 IUCN Red List of Threatened Species – www.iucnredlist.org

Botanical Report

Tatiana Erika Boza Espinoza, Mireya Natividad Raurau Quisiyupanqui & Sandro Espinoza Duran.

1. Methodoly

The botanical surveys were carried out by setting up sample plots of 0.1 ha. (100x10m) for trees, and transects of 100m² (50x2m) for herbaceous plants, bushes, epiphytes, ferns, lianas and trees of a maximum 2m high. Plots were located in places we saw the Horned Curassow previously. Transects were located in places that represent the general habitat type and the various microhabitat types in the area. The plots and transects elevations are shown in Table 13.

Sites	Altitude
Golondrina I	1200 m.
Golondrina II	1200 m.
Golondrina III	1095 m.
Quimpichari I	1180 m.
Quimpichari II	891 m.
Quimpichari III	1050 m.
Quimpichari IV	1400 m.
Casa Real I	1220 m.
Casa Real II	1060 m.

Table 13. Altitudes of botanical plots and transects.

In each plot we registered all trees with a diameter at the breast height (DBH) ≥ 2.5 cm; we standardized this measure to 1.3m high. We collected the following data for each individual plant: family, scientific name (if it was identified in the field), DBH and total height (estimated). For trees with buttresses we measured the DBH at 10cm above the point where the trunk became regular.

For transects, we sampled every individual plant that occurred in the study area. We registered the individual plant type (following the Whittaker Plants Classification System (Matteucci & Colman 1982)) and the number of individual plants to determine their density and frequency. In each plot and transect, samples of fruiting and flowering species were collected to establish the general floristic composition for each site.

We also carried out general plant collection of flowering and fruiting species throughout the area to make identification of the non-flowering samples from transects easier.

Generally, we took three samples per species when they were sterile and four when they were fertile. Each sample was given a unique code, pressed, preserved in alcohol and dried and identified using reference collections before being deposited in the herbarium.

1.1 Data analysis

Data collected in the field was entered in to an electronic datasheet for later analysis. During the analysis we determined the diversity expressed as number of individuals, families and species that occurred in each of the sample units and in the whole study area. Then, we determined the absolute and relative abundance parameters, frequency and dominance.

With numeric data like diametric and height classes, we elaborated histograms that reflect the total forest structure. Then, we interpreted the floristic richness for each study site and their similarities. For similarity analysis we chose de Morissita Similarity Index (Modif. by Horn (Matteucci & Colman 1982)), where the established values for similarity coefficients are between 0= no similarity, and 1= high similarity (Krebs C. 1989). Based on the similarity matrix generated, we carried out a grouping analysis and represented the sequence of similarity in a dendrite scheme or dendrogram (Crysci J. & Lopez M. 1993).

For floweriest composition analysis, we used the statistical program PAST which we used to find the Shannon Wiener diversity index and Morissita Similarity index. This mathematical expression, allowed us to summarise the number and degree of the relatedness between two sites, based on similarities or differences and between.

We expressed the amount of different forest life forms (herbs, bushes, trees etc) from the different study sites in to help us describe and compare the vegetation structure for each site.

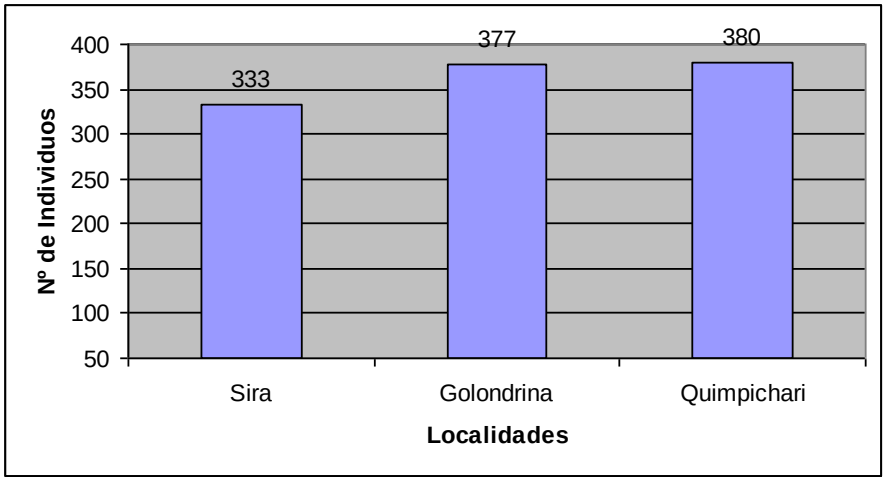
2. Results

2.1. Species Richness Estimation

We studied 3 sites: Casa Real, Golondrina and Quimpichari, in each site we evaluated 0.1 ha for trees. For transects for herbaceous plants, bushes, epiphytes, ferns, lianas and trees of a maximum 2m high, we made two transects at Casa Real covering an area of 200m^2, three transects at Golondrina covering an area of 300m^2 and four transects at Quimpichari covering an area of 400m^2. The differences between the number of transects in each site was because trail length was different for each site. We collected a total of 1,113 individual plant sample from 62 families.

2.2. Study sites forest structure

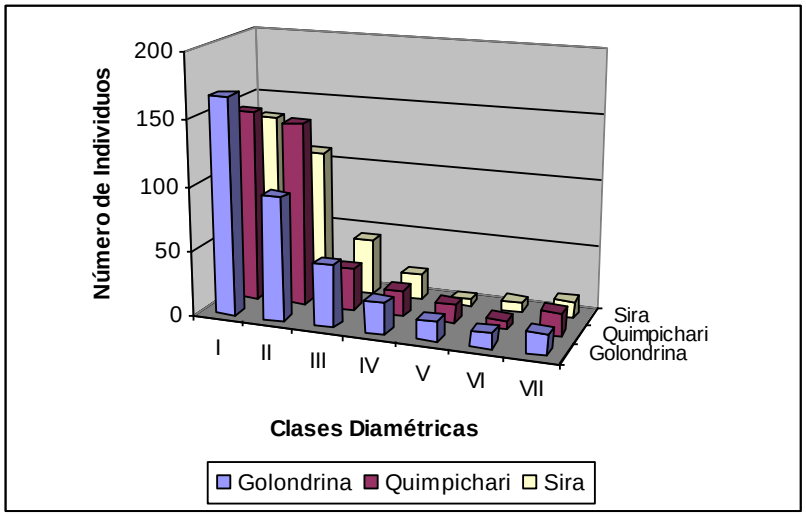
We studied 3 sites: Casa Real, Golondrina and Quimpichari. At these sites we registered a total of 1090 trees; Quimpichari was the forest with most individuals with 380 for 0.1 ha. followed by Golondrina with 377 and Sira with 333 individual per 0.1 ha. (Graphic N^o 3)



Graphic Nº 3. Shows the number of trees found in each plot for each study site

The forest structure expressed by its diametric distribution is similar to an inverted "j", with more abundance of minor diametric class individuals and when the diameter increase, the number of individuals diminish proportionally (Graphic Nº 4) i.e. there are more trees abundance in the first and second diametric classes (2.5 – 10 cm.). It is possible that this forest characteristic is consequence of human intervention for logging or natural phenomenon like land slides that occur frequently in the area.

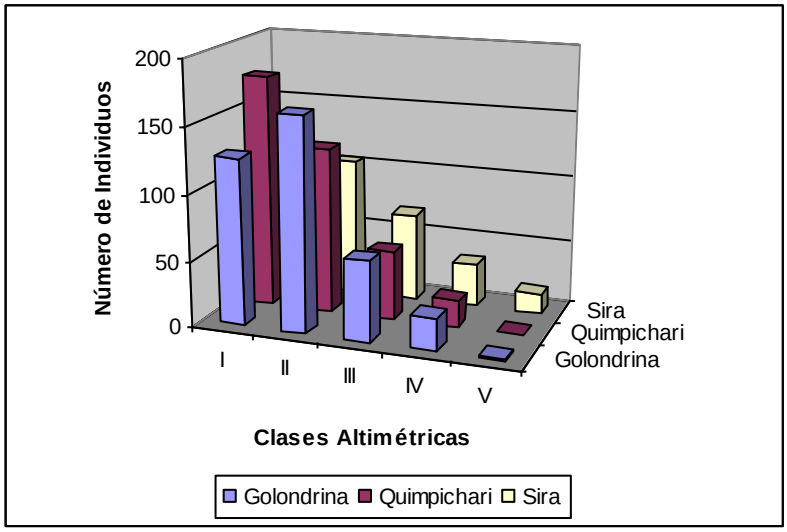
For data treatment we divided data in diametric classes: Class I (2.5 to 5 cm.), Class II (5 to 10 cm.), Class III (10 to 15 cm.), Class IV (15 to 20 cm.), Class V (20 to 25 cm.), Class VI (25 to 30 cm.) and Class VII (30 to >30 cm.).



Graphic Nº 4. Diametric distribution of the number of at each study site.

The vertical structure (Graphic Nº 5) shows the same pattern than the horizontal structure, with more abundance of minor class individuals and when the high increase the number of individuals diminishes proportionally. This is a proportional representation of the development stages in a forest that constitute

the whole populations (diversity) and the laws that regulate them (competition, regeneration, grown and mortality).
For data treatment we also divided data in height classes: Class I (0 to 5 m), Class II (5 to 10 m), Class III (15 to 20 m), Class IV (20 to >20 m)

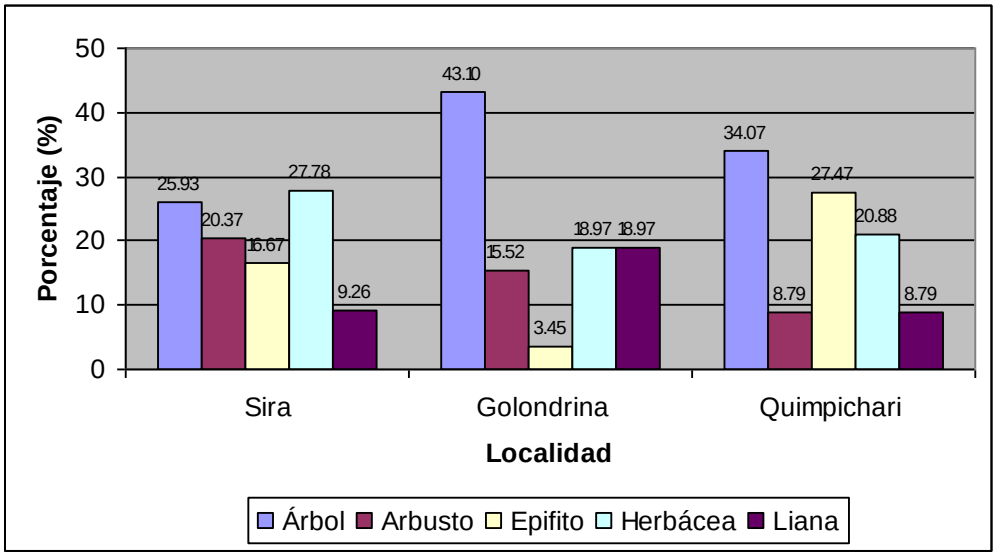


Graphic Nº 5. Height distribution of the number of individuals at each study site.

Some species individuals are present in all forest stratums like *Dyctiocarium sp* and *Wettinis*, while there are others that are part of the emergent stratum and are above the canopy, the more abundant species being *Hevea sp* (Euphorbiaceae), *Protium sp* (Burseraceae), *Parkia sp* (Fabaceae) and *Sorocea sp* (Moraceae). There are as well other species that are restricted to the undergrowth, being the species with more abundance *Faramea sp* (Rubiaceae) and all species from the genus Cyathea (Cyatheaceae). In the same way there are species that grow up until certain height or forest stratum to satisfy their light necessities like *Pausandra sp* (Euphorbiaceae) *Geonoma sp* (Arecaceae), *Palicourea sp* and *Psychotria sp* (Rubiaceae).

2.3. Life forms or habit characteristics

Percentage of different life forms at each study site are shown in Graphic Nº 6. Following the Whittaker Plants Classification System we considered the following life forms herbaceous plants, bushes, epiphytes, ferns, lianas and trees of a maximum 2m high.



Graphic N° 6. Percentage of life forms for each study sites. Bars on graph from left to right represent trees (less than 2m), bushes, epiphytes, herbs and lianas.

There are differences between life forms characteristics that help us to describe the vegetation tendency of each site. The most clear is the differences between trees less than 2m high percentages in each site. Golondrina presents the biggest percentage 43.10% of trees less than 2m high and Casa Real has the lowest percentage 25.93%. This suggests that Golondrina's forest is recovering from some disturbance.

Another life form with differences is epiphyte and also Golondrina has the lowest percentage 3.45%. Epiphytes are well develop in trees with a DAP bigger or in the diametric class III (> a 10 cm.) so the lowest percentage in Golondrina is because it did not have a big percentage of trees less than 2m high in comparison with other sites. Herbaceous plants, bushes and liana are similar at the three study sites.

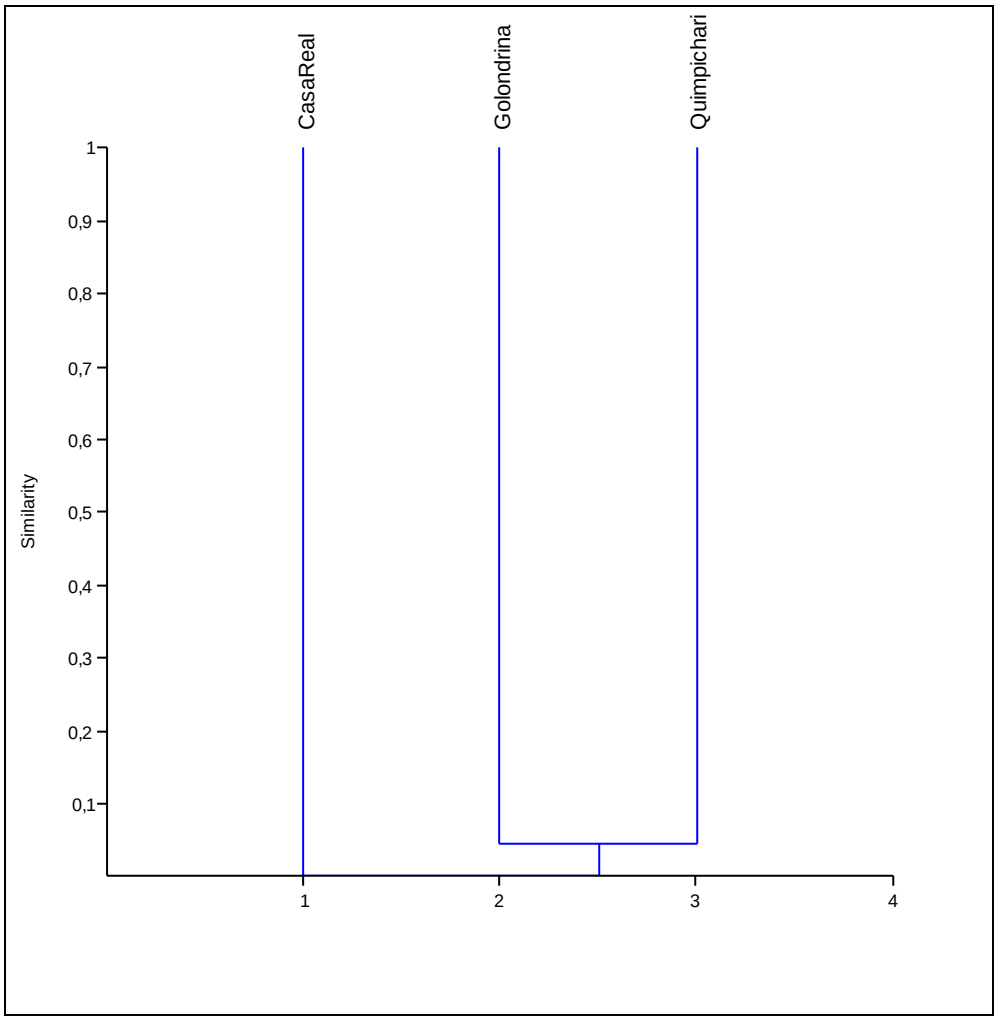
2.4 Similarity comparison between plots

Morissita similarity index shows that there was low species similarity between forest at Golondrina and Quimpichari with a value of 0.022. And there are no species similarity between Golondrina and Casa Real, or between Quimpichari and Casa Real with 0 value for both. See Table 13 and Graphic 7.

Table N° 13. Morissita similarity index

	Golondrina	Quimpichari	CasaReal
Golondrina	1	0,021818	0
Quimpichari	0,021818	1	0
CasaReal	0	0	1

Graphic N° 7. Morissita similarity index Dendrogram



For the Shannon Wiener diversity index, of the three sites evaluated Quimpichari has the highest diversity with a value of 4.131. Casa Real has the lowest diversity with a value of 3.362. See table Nº15

Table Nº 15: Diversity Index

	Golondrina	Quimpichari	CasaReal
Taxa S	58	90	54
Individuals	179	235	243
Shannon H	3.616	4.131	3.362

2.5 Habitat description

This section provides a habitat description of each sampled plots in Casa Real, Golondrina and Quimpichari. The aim was to establish a general idea of the vegetation type in the areas sampled, provide a structural description of the vegetation and highlight the more representative species for each vegetation stratum.

2.5.1 Vegetation stratum characterization

The vegetation is in four stratums:

Herbaceous plants stratum. This is the stratum from the ground to 0.5m high. This area most frequently had species from families Araceae, Cyclanthaceae, Gesneriaceae, Maranthaceae, Poaceae and we could also find Pteridophytos.

Bush stratum. This is the stratum with height greater than 0.5m. This stratum had the following families most frequently: Araliaceae, Campanulaceae, Piperaceae and Melastomataceae.

Lower arboreal stratum. This is the stratum between 2 and 20m high. In it the following frequent families were most frquent: Arecaceae, Melastomataceae, Myrsinaceae, Myrtaceae and Rubiaceae, also arboreal fern from the genus Cyathea.

Upper arboreal stratum. This is the stratum with individuals of 20m hight or more. Canopy coverage was 20 - 30%. Frequent species: Euphorbiaceae, Melastomataceae, Moraceae, Myristicaceae, y Sapotaceae.

3. Conclusions

We evaluated a total of three sites: Casa Real, Golondrina and Quimpichari in which we evaluated 1090 trees. The families with the biggest number of trees were the Arecaceae, Rubiaceae, Euphorbiaceae, Myrsinaceae, Moraceae and the Pteridophytos. The site with most individuals was Quimpichari, with 380 individuals /0.1 Ha. We collected a total of 62 families distributes in 136 genus and the floristic composition of Casa Real, Golondrina and Quimpichari forest is most commonly made up of two big groups: Ferns and Angiosperms, however we did not collect Bryophytes and Lichens.

According to the Peruvian Flora species classification approved by INRENA (Peruvian natural resources management organisatio) in 2000. The studied sites have high conservation importance because they hold species from the families Arecaceae and Orchidaceae that are included Near-threatened and Vulnerable. There are also arboreal ferns from the family Cyatheaceae that are Vulnerable. Additionally the families Cyatheaceae with the species *Alsophila cuspidata* (Kuntze) Conant y Orchidaceae and the species *Phragmipedium pearceii* (Reichenback) Rauh & Senghas are included in the "Convention on internacional Trade in Endargered Species of Wild Flora and Fauna" CITES . The Shannon Wiener diversity index shows that Quimpichari forest is the most diverse and has a high diversity value of 4.131. The Shannon Wiener diversity comprises values from 1 to 5, meaning that Quimpichari forest is very diverse.

Orchidacea

Photo by: T. Boza

Pasifloracea

Photo by: T. Boza

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Communal Reserve El Sira

Melvin Gastañaga Corvacho

1. Working with the Communal Reserve El Sira – Park guards

Since the beginning of this project we were working closely with the park guard of Sira Communal Reserve in this area, Eduardo Martinez. He is the only person assigned to patrol and protect the east part of the Sira Communal Reserve. He is working in the area for more than a year patrolling, protecting all species and talking with local communities about their resources. Even though he has good intentions to help protect the area, the total size of the communal reserve is an enormous 616 413, 41 ha. (INRENA 2006) and he can not protect the whole east part of the area by himself at the same time.

He was really helpful, giving us advice about communities work. At the same time we were giving him information about the Peruvian Southern Curassow, its location and its requirements for conservation. Also, he was able to explain us their needs to protect the area, like enough quality field equipment that they did not have. The national organization in charge of the Protected Areas in Peru (INRENA) provided them with field equipment last year, but this equipment was not good enough to resist the strong weather in the area. So as part of this project we decided to provide him the type of equipment needed to carry out his work, like a waterproof tent.

Recently he has told us that this equipment was really helpful for him and some other guys that work sometimes in the protected area, especially in this strong rainy season.

Local park guard receiving field equipment

2. Feasibility for a Private Reserve

We have being talking to people incharge of the Communal Reserve El Sira and its local park guard and investigating the feasibility to create a Private Reserve in the Buffer area of Sira Communal Reserve to guarantee the protection of the endangered Peruvian Southern Horned Curassow.

Our studies found the Peruvian Southern Horned Curassow mainly in the buffer area of Sira Communal Reserve close to the local communities of El Paucarcito and Quimpichari. Last year INRENA decided to give all the communities around Sira Communal Reserve the land in the buffer area including the part where we found the curassow. Now, this part is being disputed by two local communities that believe they are not being given big enough lands, Nueva Austria and El Paucarcito. This dispute will last for some time since local authorities can not decide which one is the needed one.

As a condition on this repartition of the land, INRENA is requiring local communities not to sell their lands in the buffer area, if they should sell it they will lose all their rights on the lands they own. As a result of this repartition, with help of some international organizations like USAID, local communities around Sira reserve have formed an organization called ECO-Sira that aims to protect their own resources, such as medicinal plants and wild animals just for their own consumption. This ECO-Sira currently does not include protection of endangered species like the Peruvian Horned Curassow and other mammals.

In the area we have been working we saw lots of local people selling meat and fur of wild animals to people in the towns an close cities. So this would mean that they could potentially continue hunting in the Sira Mountains not just for their own consumption.

Given all these recent activities in the area, the creation of a private reserve in the area is not possible. But we believe we could join with the ECO-Sira organization to provide them help and advice on environmental management and gain their help in protecting the threatened species and formulating new projects that involve working with local communities to protect their unique species.

Conservation Recommendations

- Promote conservation of threatened species of Sira around the mountains by giving the local people alternatives to hunting.
- Start informative courses about sustainable use of natural resources from the area. Giving them alternatives to over exploitation of the resources.
- Develop a long-term conservation project in the Sira area aimed at conserving the habitat and its unique species.
- Visit the other local communities in the area that surrounds Sira, whom we didn't have the resources to reach with previous environmental education programmes.
- Contract park guards for the area from the local communities to help control hunting and logging.
- Work closely with ECO-Sira in order to ensure the protection of endangered species.

Given the threatened status of the Horned Curassow and it small range, it is important to begin constructive conservation actions for the species. We need to develop a long-term conservation project in the Sira area aimed at conserving the habitat and this unique species. It is imperative to continue the work described in this report by conducting an environmental education campaign in the other local communities in the area that surrounds Sira. We need to promote conservation of threatened species of Sira around the mountains by giving the local people alternatives to hunting and begin informative courses about sustainable use of natural resources from the area - giving them alternatives to over exploitation of the resources. It is important to improve the protection infrastructure of El Sira by contracting park guards for the area from the local communities to help control hunting and logging. Also it would be really useful to conduct another local information survey in the area, this time all around Sira Mountains, in order to determine the species distribution.

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