

Searching for the endangered red-billed curassow in the Brazilian Atlantic Rainforest

Rufford Interim Report



Red-billed curassows are endemic and threatened species of the Brazilian Atlantic Rainforest. The male has a red bill (Photo: [Ciro Albano](#)® in Vale Reserve, Espírito Santo State, Brazil).

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Introduction

Population assessment is one of the most important data for planning management strategies for a threatened species. However, it is difficult to obtain such information when species are rare and cryptic. This is the case of the endemic cracid of Brazilian Atlantic Rainforest, the Red-billed curassow (*Crax blumenbachii*).

This bird is threatened due to hunting pressure and habitat loss. The most recent population assessments were carried out in 2006 (Una Biological Reserve and Conduru State Park Bahia state) and in 2009 (Descobrimento National Park, Bahia state). Line transect is the commonest used method to study the species, where the research records sightings, vocalizations and other evidences such as feathers, nests and eggs (Gatto et al. 2007, Alvarez & Develey 2010). Although relative abundance (records/10 km) can be easily measured, population density is more difficult to obtain because many records are needed (> 40 according to Buckland et al. 2001). Camera traps are also used to confirm the presence of the species in the study area (Alvarez & Develey 2010, Srbeck-Araujo et al. 2012).

This project encompasses two actions of the National Action Plan of Red-billed Curassows (IBAMA 2004), and both have high priority “3.1: Survey the localities where the species has been recorded in the past to assess its current distribution” and “3.2: Conduct surveys of known populations to obtain estimates of their size and to collect information on habitat use patterns through standardized methodologies”.

We aimed to update population assessment data of Red-billed curassows in Conduru State Park (Bahia state) with the line transect methodology, allowing comparison between different areas and different periods in the same area (Figure 1). We also randomly distributed some camera traps in the study area. The sponsorship of Rufford Small Grants and other organizations (see previous page) allowed us not only the research in Conduru State Park, but also Una Biological Reserve (Bahia state). Thus, data on both study areas are presented here.



Figure 1. Above is a beautiful view of Serra do Conduru State Park, which is one of the Atlantic Rainforest areas where wild Red-billed curassows still persist nowadays.

Progress to date

Data were recorded by the Principal Investigator (Christine S.S. Bernardo) and 2 undergrad students of Universidade Estadual do Sudoeste da Bahia (Joedison S. Rocha and Aiala Souza). The students were trained to collect data with line transect methodology and distinguish vocalizations from September to December 2012. The three observers walked simultaneously through three different trails, and each researcher was accompanied by a park ranger or by another undergrad student, for safety reasons.

The research team walked 140.5 km in Serra do Conduru State Park and 144.9 km in Una Biological Reserve, from January to July 2013 between 5 a.m. to 17:30 p.m. The researchers walked mainly on narrow trails (1.5 to 3 m width and 1 to 9 km length), but dirty roads were also walked because the species is also seen in this environment by park rangers, local inhabitants or other researchers (Figure 2).

The minimum effort required for reliable estimations of abundance is 40–90 km of transects for large birds in neotropical forests (Thoisy et al. 2008).

The Red-billed curassows were recorded 12 times in Conduru State Park, including sightings, vocalizations and feathers encountered on the trail (Figure 3). Thus, relative abundance was 0.85 records/10 km, which means that a researcher has to walk a minimum of 11.7 km to have the chance to see the bird one time, applying the line transect methodology). The Red-billed curassows were recorded 4 times in Una Biological Reserve

(relative abundance was 0.27 records/10 km, which means that a researcher has to walk a minimum of 37 km to have the chance to see the bird once).



Figure 2. Trails and dirty roads walked in Conduru state Park and Una Biological Reserve during January to July 2013: (A) The Red-billed curassow team was accompanied by a park ranger when recognizing the study area, during the process of cutting, measuring and marking the trails with colored tapes and GPS; (B) One of the trails in the north part of Serra do Conduru State Park, where an individual of Red-billed curassow was seen in January 2013. In this period, water is accumulated on the ground, where some individuals of the species drink water; (C) dirty roads were also walked by the Red-billed curassow team searching for Red-billed curassows.

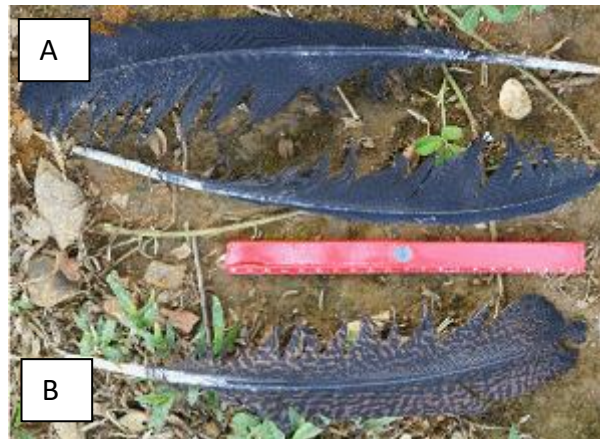


Figure 3. Feathers encountered in the north part of Conduru State Park: (A) a feather of the wing of a female, (B) two black feathers possibly from a male. The feathers are now in the Genetic Lab of Dsc. Mercival Roberto Francisco (Univeristy of São Carlos, Sorocaba, São Paulo State, Brazil), where maybe DNA can be extracted and compared to genetic diversity of captive bred birds.

The Red-billed curassows were most frequently recorded between 12-13h in both study areas, although the species was active during all day (Figure 4). Thus, we can detect no peak of activity period of this bird species while we were searching for them.

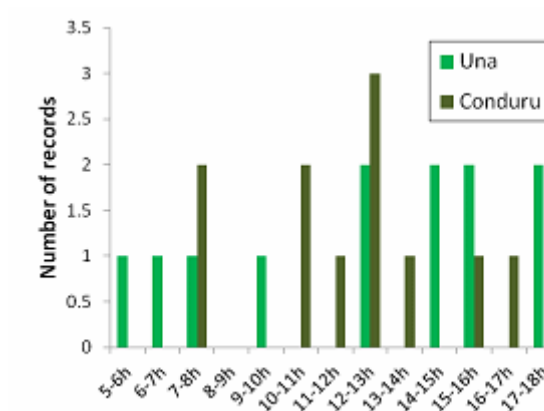


Figure 4. Number of records of Red-billed curassows during the study period in Serra do Conduru State Park and Una Biological Reserve (Bahia, Brazil) along the day (5 a.m. to 18 p.m.). It is considered the sightings and vocalizations recorded by the research team, park rangers and researchers from other projects while the Red-billed curassow team was in the study area.

Camera traps were installed in both study areas, summing up an effort of 683 hours between January and July 2013. A picture of a female was taken in Una Biological Reserve in January 2013 (Figure 5).



Figure 5. A female *Crax blumenbachii* in Una Biological Reserve, Bahia state (January 2013) recorded in a camera trap.

The few records of the species in both study sites confirm the species still persist in the areas, although its detection is difficult due to its rarity and inconspicuousness (Collar & Gonzaga 1988). Serra do Conduru State Park is a very important area for the species conservation, once the relative abundance is the highest for Bahia state (Table 1). Una Biological reserve and Descobrimento National Park are also important areas for the Red-billed curassows, and presented the same relative abundance (Table 1). The data presented in this study can be used by IUCN for updating the conservation status of the species in 2014.

Table 1. Relative abundance of Red-billed curassows in some forest fragments of Bahia state, Brazil

Study area	Effort (total Km walked)	Relative abundance (records/10 km)	References
Michelin Private Reserve	950.0	0.04	K.Flesher, unpublished data (2001-2009)
Descobrimento National Park	328.8	0.27	Alvarez e Develey, 2010
Una Biological Reserve	307.5	0.13	Gatto <i>et al.</i> , 2007
Una Biological Reserve	144.9	0.27	This study
Serra do Conduru State Park	22.2	0.45	Gatto <i>et al.</i> , 2007
Serra do Conduru State Park	140.5	0.85	This study

This research is being presented in some important Brazilian events during 2013, such as the Biology's Week 2013 (Universidade Estadual do Sudoeste da Bahia, Jequié, Bahia, Figure 6) and Brazilian Ecology Congress (Porto Seguro, Bahia, Brazil).

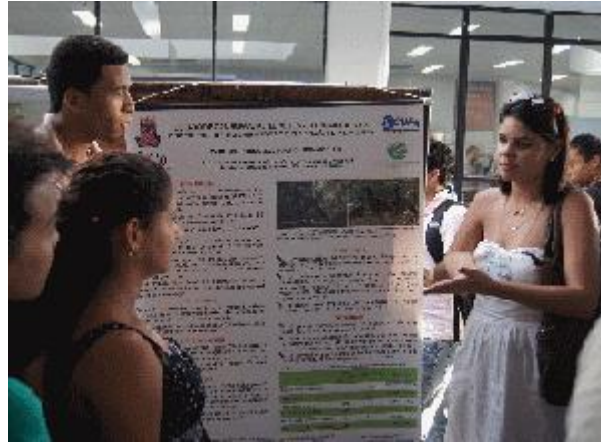


Figure 6. Banners are being presented by the research team in some important events in Brazil. Above, the undergrad student Aiala Souza (right side) is explaining the banner to some interested students at the “Biology’s Week 2013” at Universidade Estadual do Sudoeste da Bahia (Jequié, Bahia, Brazil).

The same methodology of line transects can also be used to recorded data of other endemic and threatened species, such as the primates Yellow breasted capuchin monkeys (*Sapajus xanthosternos*) and Wied marmosets (*Callithrix kuhlii*) (Peres et al. 1999). In this study we recorded 4 species with the line transect method in addition to the Red-billed curassow in Serra do Conduru State Park and 10 species in addition to the Red-billed curassow in Una Biological reserve (Table 2, Figure 7). Thus, the Red-billed curassow can be considered an umbrella species and the methods used for studying the species as well as the future conservation efforts can also reach other species.

Table 2. Other species recorded with the line transect methodology in Una Biological reserve and Conduru State Park between January and July 2013.

Scientific name	Common name	Una	Conduru
<i>Callicebus melanochir</i>	Titi monkey	X	
<i>Leontopithecus chrysomelas</i>	Golden headed lion tamarin	X	
<i>Sapajus xanthosternos</i>	Yellow breasted capuchin monkey	X	X
<i>Callithrix kuhlii</i>	Wied marmoset	X	X
<i>Bradypus torquatus</i>	Maned sloth	X	
<i>Pecari tajacu</i>	Collared peccary	X	
<i>Dasyprocta azarae</i>	Azara's agouti	X	X
<i>Penelope superciliaris</i>	Rusty Margined Guan	X	X
<i>Mazama americana</i>	Red brocket	X	
<i>Nasua nasua</i>	Coati	X	



Figure 7. Threatened species recorded in Conduru State Park (B, E, F) and Una Biological Reserve from January to July 2013 (A to F). A – Titi monkey (*Callicebus melanochir*); B – Yellow breasted capuchin monkey (*Sapajus xanthosternos*); C – Maned sloth (*Bradypus torquatus*); D – Golden headed lion tamarin (*Leontopithecus chrysomelas*); E– Wied marmoset (*Callithrix kuhlii*); F– Red-billed curassow (*Crax blumenbachii*). Credits: A) <http://www.flickr.com>; B) Eol.org; C) pvhsustentabilidade.blogspot.com; D) Sabrina Sayegh (pt.treklens.com); E) <http://www.ecoparque.org.br>; F) Christine Steiner São Bernardo.

Key findings and next steps

- ✓ Serra do Conduru State Park presented the highest relative abundance of Red-billed curassows in comparison to other Forest fragments in Bahia. Thus, the results demonstrate the importance of this area for the conservation of this threatened bird species.
- ✓ The low relative abundance of the species in most of the forest fragments studied in Bahia state is of great concern because the species is globally threatened by extinction and population trend is decreasing according to IUCN (2013).
- ✓ The line transect methodology is also effective for other threatened species of the Atlantic rainforest and the Red-billed curassow can act as umbrella species.
- ✓ The few records show that the species is difficult to see but confirm the species persistence in both study areas.
- ✓ The next fieldwork campaigns will be concentrated in areas located in center and south part of Serra do Conduru State park, increasing effort and area surveyed (Figure 8).

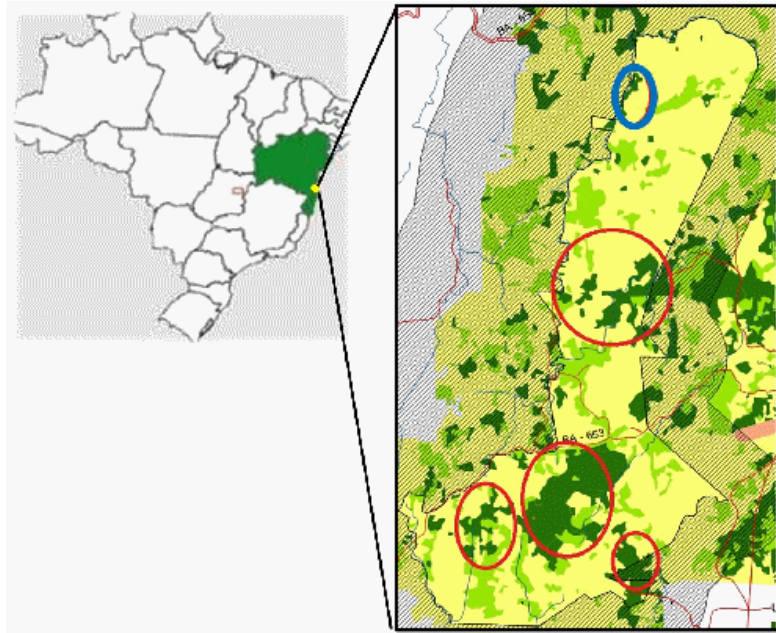


Figure 8. Serra do Conduru State Park (as well as Una Biological reserve) is located in southeastern Bahia, Brazil. The yellow part of the large figure is Serra do Conduru State Park. The blue circle indicates the area where we searched for Red-billed curassow during January to July 2013. The red circles are areas where we will search for red-billed curassows in next fieldwork campaigns.

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