



The importance of protected areas for conservation of bare-faced curassow (*Crax fasciolata spix, 1825*) (Galliformes: Cracidae) in the São Paulo State, Brazil

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Abstract: The Bare-faced Curassow *Crax fasciolata* (Cracidae:Cracinae) is a vulnerable species that was classified as critically endangered by the São Paulo State -Brazil, in 2008. Specialists recommended “searches for areas where there may be a few remaining populations and protection of the last remaining semideciduous forest in the State”. Protected areas were investigated in the Cerrado and semideciduous forest in São Paulo State by camera trapping to evaluate the presence of the Bare-faced Curassow. Eight protected areas in Cerrado biome were investigated, but the Bare-faced Curassows was recorded only at Furnas do Bom Jesus State Park (2,069 ha), São Paulo State despite the large sampling effort in larger protected areas such as the Santa Bárbara Ecological Station (2,712 ha) and Jataí Ecological Station (9,074 ha); the largest protected area of Cerrado biome in São Paulo State. This record of *C. fasciolata* is important for the Conservation Action Plan for the Cracid family and shows the importance of monitoring biodiversity and conserving even relatively small remnants of native vegetation for the conservation of this species.

Keywords: Cerrado, camera trap, conservation, endangered birds.

A importância das áreas protegidas na conservação do mutum-de-penacho (*Crax fasciolata spix, 1825*) (Galliformes: Cracidae) no estado de São Paulo, Brasil

Resumo: O mutum-de-penacho *Crax fasciolata* (Cracidae:Cracinae) é uma espécie ameaçada de extinção e foi considerada criticamente em perigo em 2008 no estado de São Paulo. As recomendações dos especialistas para a conservação da espécie no estado foram “a pesquisa por áreas onde poderia existir populações remanescentes e a proteção de remanescentes de floresta semidecidual”. Neste trabalho, oito Unidades de Conservação foram investigadas em áreas com vegetação de Cerrado e de floresta semidecidual por meio de armadilhas fotográficas digitais para verificar a presença do mutum-de-penacho (*Crax fasciolata*). Entretanto, o mutum-de-penacho foi registrado apenas no Parque Estadual Furnas do Bom Jesus, que possui 2.069 ha, apesar do maior esforço amostral em áreas maiores, como a Estação Ecológica de Santa Bárbara (2.712 ha) e Estação Ecológica de Jataí (9.074),- a maior Unidade de Conservação do bioma Cerrado no estado de São Paulo. O registro do mutum-de-penacho no Parque Estadual Furnas do Bom Jesus é muito importante para o Plano de Ação e Conservação da família Cracidae e mostra a importância do monitoramento da biodiversidade e a conservação de remanescentes de vegetação nativa, mesmo pequenos, para a conservação dessa espécie.

Palavras-chave: armadilhas fotográficas, aves ameaçadas, Cerrado, conservação.

Introduction

Among groups of birds quite affected by human activities is the Cracidae family, the most threatened among birds on a global level (Pinilla-Buitrago et al. 2014). This family is endemic to the Neotropics and consists of a group of large frugivorous birds and seed eating (Sick 1997, Brooks and Strahl 2000). Brazil has the second highest diversity of cracids in the world (22 species; Silveira et al. 2008) and the highest number of endemic species of any Neotropical country, with approximately half of the Guans and Curassows considered vulnerable or at risk (Brooks and Strahl 2000). Five of its six endemic species and two of its six endemic subspecies are on the priority list (Brooks & Strahl 2000). Of particular interest for conservationists are the eastern and central forests, where a number of species are now endangered or highly vulnerable (Brooks & Strahl 2000). The main threats to the species of cracids are poaching, habitat fragmentation, deforestation and predators such as domestic dogs *Canis familiaris* (Sick 1997, Brooks and Strahl 2000).

In the São Paulo State, there are five species of cracids (Silveira & Uezu 2011): *Ortalis guttata* (Spix 1825), *Penelope superciliaris* Temminck, 1815 LC, *Penelope obscura* Temminck, 1815 LC, *Pipile jacutinga* (Spix 1825) and, *Crax fasciolata* Spix, 1825. The last two species are considered endangered and vulnerable, respectively (IUCN 2014). Absence of cracids in tropical forests can affect several ecological processes since they are important seed dispersers and are therefore very important component in the community to maintain forest ecosystem (Brooks & Fuller 2006, Galetti et al. 1997).

The bare-faced curassow *Crax fasciolata* (Cracidae:Cracinae) is a vulnerable species (IUCN 2014) that occurs in the eastern-central and southern Brazil, Paraguay, eastern Bolivia and Argentina (Delacour & Amadon 2004, Pereira & Brooks 2006). It is mostly terrestrial, occurring in semi-deciduous and gallery forests, but also on forest edges and forest clearings (Lowen et al. 1996, Wallace et al. 2001, White 2001, Pereira & Brooks 2006). The species is either solitary or live in pairs, although it has also been reported group of males (Pereira & Brooks 2006, Desbiez & Bernardo 2011). The bare-faced curassow feeds mostly on fruits, but also on seeds, flowers and invertebrates (Delacour & Amadon 2004, Muñoz & Kattan 2007), playing an important role as seed disperser and on forest regeneration, especially in forest clearings (Silva & Strahl 1991, Golçalves et al. 2010, Langanaro 2013). The main threats to *C. fasciolata* are habitat loss and poaching (Del Hoyo 1994, Caziani et al. 1997, Brooks 1999).

In Brazil, the bare-faced curassow has been reported from south of the Amazon River to the western State of São Paulo and Minas Gerais (Sick 1997). Despite having a wide distribution, the species is endangered in Minas Gerais State (Minas Gerais 2010) and critically endangered in Paraná State (Paraná 2004). In 1993, the species was considered disappearing species in São Paulo (Willis & Oniki 1993); later, other authors argued that the species was “practically extinct in the State” (Bressan et al. 2009, São Paulo 2010).

The IUCN Cracid Action Plan created in 2000 by the Cracid Specialist Group (CSG) highlights the importance of conserving the Cracid family and lists the *C. fasciolata* as of high conservation priority (BirdLife International 2009, Langanaro 2013), indicating the need of research analyzing the protected areas of Brazil, the role of cracids as environmental indicator species, and the conservation of priority species. In 2014, it was recommended guidelines for *C. fasciolata* conservation

management in the São Paulo State (São Paulo, 2014). Despite such recommendations, knowledge of the species occurrences is still lacking in many regions, even in protected areas. In São Paulo State, Brazil, for instance, there are gaps of bird inventory in the north, west and southern regions (Silveira & Uezu 2011). In this study, we performed an inventory in eight protected areas in the north of São Paulo State using camera-traps. We reported *C. fasciolata* for the first time in the Furnas do Bom Jesus State Park, showing the importance of this protected area for conservation of this species in the São Paulo State.

Material and Methods

The study was conducted in eight areas of Cerrado vegetation included in the original distribution of *C. fasciolata*:

1) Furnas de Bom Jesus State Park (Furnas) (20° 11' S/47° 22' W) located in the northern São Paulo State, Brazil (Figure 1). The park (2,069 ha) is a Cerrado fragment surrounded by an altered matrix composed of pastures, coffee plantations, roads, and human settlements. The park does not have any recent avian inventory published;

2) Jataí Ecological Station (Jataí) located in the northeastern of São Paulo State (21° 30' S/47° 40' W) is one of the largest remnants of the Cerrado biome in the state (9,074 ha; Figure 1). The surroundings of the Jataí consists mainly of sugar cane plantations, forest plantation (*Eucalyptus* sp. and *Pinus* sp.), citrus plantations, pastures and roads such as the SP-253 highway. There are 211 bird species recorded for the area (Almeida 2002);

3) “Augusto Ruschi” Biological Reserve (Augusto Ruschi) is located in the municipality of Sertãozinho, in northeastern São Paulo State (21° 10' S/48° 05' W; Figure 1). It has a total area of 757 ha divided into five forest fragments ranging from 55.07 ha to 189.21 ha that are 300-1000 m apart from each other. The Augusto Ruschi consists of pasture and forest fragments of seasonal semi-deciduous forest. In addition to pasture, the area is surrounded by sugar cane plantations and is crossed by the SP-333 highway;

4) Bebedouro State Forest (Bebedouro) is located in the municipality of Bebedouro, northeastern São Paulo State (20° 57' S/48° 27' W) (Figure 1). It has an area of 99.41 ha semi-deciduous forest and forest plantation (*Eucalyptus* sp. and *Pinus* sp.) surrounded by sugar cane plantations and pasture. There are 37 species of birds recorded in this area (Lopes et al. 2007);

5) Santa Bárbara Ecological Station (Santa Bárbara) is located in the municipality of Águas de Santa Barbara, central-southern São Paulo State (22° 46' S/49° 10' W), and has a total area of 2,712 ha (Figure 1). It consists largely of Cerrado, being composed predominantly by grassland and savanna-type formations surrounded by forest plantations (*Eucalyptus* sp. and *Pinus* sp.), pastures, and sugar cane plantations. There are 226 species of birds recorded in this area (Lucindo et al. 2015).

6) Porto Ferreira State Park (Porto Ferreira) is located in the municipality of Porto Ferreira (21° 49' S and 27° 25' W) and has a total area of 637 ha. It is composed of remnants of semideciduous and closed seasonal forest surrounded by sugarcane cultivation, forest plantations (*Eucalyptus* sp. and *Pinus* sp.), citrus and pasture (Mendes et al. 2009). There are 186 species of birds recorded in this area (São Paulo 2003).

7) Experimental Station Santa Rita do Passa Quatro (Santa Rita do Passa Quatro) is located in the municipality of Santa Rita do Passa Quatro, SP (21° 44' S and 47° 29' W), and consists of three fragments

Protected areas and *Crax fasciolata* conservation

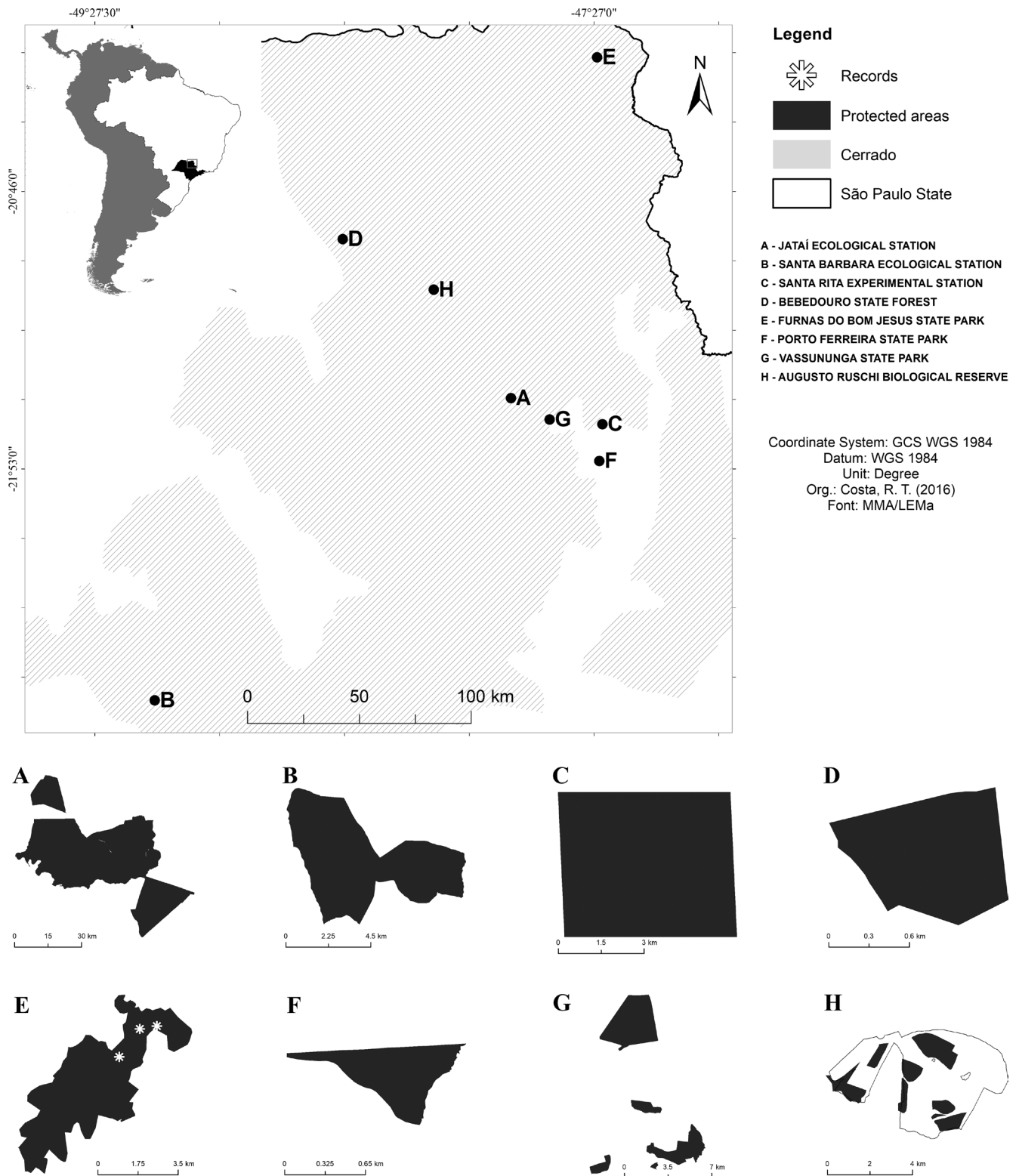


Figure 1. Maps of the areas sampled in São Paulo State, Brazil. (A) Jataí Ecological Station, Luiz Antônio, SP. (B) Santa Bárbara Ecological Station, Águas de Santa Bárbara, SP. (C) Santa Rita Experimental Station, Santa Rita do Passa Quatro, SP. (D) Bebedouro State Forest, Bebedouro, SP. (E) Furnas do Bom Jesus State Park, Pedregulho, SP. (F) Porto Ferreira State Park, Porto Ferreira, SP. (G) Vassununga State Park, Santa Rita do Passa Quatro, SP. (H) Augusto Ruschi Biological Reserve, Sertãozinho, SP.

with total areas of 9.1 ha, 19.1 ha and 51 ha. The vegetation of the smaller fragment is constituted by semideciduous seasonal forest and pinus plantations, the fragment with area of 19.1 ha consists of cerrado vegetation, semideciduous seasonal forest and pine plantations, and the largest fragment by plantations of different species of pine and eucalyptus with some sparse native trees. The Station is divided by two highways, Zequinha de Abreu (SP-241) and Luiz Pizetta (SP-328), and its surroundings are predominantly composed of sugar cane.

8) Vassununga State Park (Vassununga) is located in the municipality of Santa Rita do Passa Quatro, and consists of six fragments which together correspond to 2,071.42 ha. For this work, five fragments (130 ha, 169 ha, 231 ha, 329 ha, and 1,217.13 ha) were sampled, all of them consisting of semideciduous seasonal forest, with the largest fragment being partially composed of cerrado vegetation. The park is divided by the Anhanguera Highway and its surroundings consists predominantly of sugarcane and forest plantations (*Eucalyptus* sp. and *Pinus* sp.), citrus and pasture. There are 259 species of birds recorded in this area (São Paulo 2009).

All areas were sampled using camera traps (Scoutguard®-SG560C and Bushnell®-Trophy Cam) distributed 0.5-1km apart from each other. When triggered, cameras took pictures with 10 to 30 second intervals. The Furnas de Bom Jesus State Park was sampled twice: in 2011 it was sampled using 36 trapping stations baited with bobcat urine (*Lynx rufus* BobcatPee®) bacon, banana, pineapple and salt, adding up a total sampling effort of 1189 trap-days; in 2013, the park was sampled with 16 trapping stations without bait and a total sampling effort of 1385 trap-days (Table 1).

The Augusto Ruschi was sampled from October 2012 to May 2013 using a total of 20 trapping stations spaced 500 m apart from each other in the five fragments comprising the reserve. The fragments were sampled one at a time, and the number of trapping stations in each fragment varied from two to six. The cameras were baited with bobcat urine (*Lynx rufus*, BobcatPee®), banana and bacon. Total sampling effort was 562 trap-days.

In all other areas we did not use bait and trapping stations were located 1 km apart from each other. From October 2014 to December 2014, Bebedouro was sampled with four stations and a total sampling effort of 190 trap-days. From January 2014 to January 2015, we established a grid of 41 stations in Jataí with total sampling effort of

2,758 trap-days. In Santa Barbara, cameras were placed in 26 stations from December 2014 to March 2015 totaling 1891 trap days. Porto Ferreira was sampled from July to October 2015 with total sampling effort of 639 trap-days and nine stations. Vassununga was sampled from November 2015 to April 2016 with total sampling effort of 1585 trap-days and 25 trap stations. Santa Rita do Passa Quatro was sampled from March to June 2016 with total sampling effort of 395 trap-days and five trap stations (Table 1).

We also performed a literature search for studies of avian inventory in São Paulo State in Web of Science and Scielo using the keywords “birds of São Paulo State”. We also used records available in the book “Aves do Estado de São Paulo” where there are informations of bare-faced curassow in museum, field and literature. We also performed a search in Scielo and Google with the same keywords in Portuguese to look for additional papers, as well as thesis, dissertations or monographs. Finally, the management plans of protected areas of Cerrado bioma in São Paulo State were verified for their respective lists of avian species (Fundação Florestal e Instituto Florestal).

We did not use records from the Wikiaves Platform because the geographic coordinates of records were not available. Besides, Wikiaves shows records of *C. fasciolata* in cities such as Bebedouro, an area with few remaining native areas; in this case, we considered the presence of this species as a possible individual translocation from other areas because is the photographed individual had leg rings. Moreover, there were no official records of *C. fasciolata* in other areas that have been well inventoried, such as São Carlos e Itirapina, but Wikiaves shows records on them (Table 2). Considering such incongruences, we decided not to use information available on that platform; only records published on scientific journals, thesis, dissertation and management plans were considered.

Results

Our total sampling effort was 10,131 trap-days, which is equivalent to 243,144 hours, from 2011 to 2016 (Table 1). Despite the large sampling effort, we recorded bare-faced curassows only at Furnas, one of the areas with 2,069 ha and for which the sampling effort was 2,574 trap-nights. Two individuals – a male and female-were recorded during six days in August and September 2011 at two trapping stations; in

Table 1. Sampled areas, size (ha), time period sampled, sampling effort (number of camera-traps × number of nights), number of trapping stations and areas where the bare-faced curassow (*Crax fasciolata*) was recorded.

Area	Size (ha)	Time period sampled	Sampling effort in trap-days	Sampling effort in hours	Number of trapping stations	Records of <i>C. fasciolata</i>
Furnas	2,069	Jul/11 to Oct/11	1,189	28,536	36	6
Furnas	2,069	Jul/13 to Nov/13	1,385	33,240	16	3
Augusto Ruschi	720	Oct/12 to May/13	562	13,488	20	No
Bebedouro	99.41	Oct/14 to Dec/14	112	2,688	04	No
Jataí	9,074	Jan/14 to Jan/15	2,768	66,432	41	No
Santa Bárbara	2,700	Dec/14 to Mar/15	1,891	45,384	26	No
Porto Ferreira	637	Jul/15 to Oct/15	639	15,336	09	No
Vassununga	2,071	Nov/15 to Apr/16	1,585	38,040	25	No
Santa Rita do Passa Quatro	79.2	Mar/16 to Jun/16	395	5,688	05	No

Table 2. Studies of avian inventory in State of São Paulo. City = indicate where the study was conducted; Record of Wikiaves = record of bare-faced curassow in Wikiaves Platform in the same city where avian inventory was conducted; Presence of Cracidae = species of Cracidae in avian inventory; Sampling method = sampling method applied in each study; Sampling effort = sample effort applied in each study; Author = authors of each study.

City	Record of Wikiaves	Presence of Cracidae	Sampling method	Sampling effort	Author
Águas de Santa Bárbara	No	<i>Penelope superciliaris</i>	Transects, engravers and observations	5 years	Lucindo et al. (2015)
Águas de Santa Bárbara		<i>Penelope superciliaris</i>	Literature review	-	São Paulo (2011)
Anhembi	No	<i>Penelope superciliaris</i>	Transects, observations and point count	8 years	Antunes (2008)
Anhembi	No	-	Transects, observations and point count	960 hours	Antunes (2007)
Bauru	No	<i>Ortalis superciliaris</i> , <i>Penelope superciliaris</i> , <i>Aburria cumanensis</i>	Literature review	-	Cavarzere et al. (2011)
Bauru		-	Point count	15 days	Cavarzere & Moraes (2010)
Bauru	No	<i>Penelope superciliaris</i>	Transects	50 hours	São Paulo (2010)
Bebedouro		-	Observation points were randomly distributed between the quadrants	3 months	Lopes (2007)
Brotas	No	-	Qualitative sampling by the points method	11 months	Pozza & Pires (2003)
Cajuru	No	<i>Penelope superciliaris</i>	Rapid assesment (Mackinnon method)	33 hours	Antunes (2014)
Campinas	No	<i>Penelope superciliaris</i>	Observation and point count	23 months	Aleixo & Vieliard (1995)
Gália	No	<i>Penelope superciliaris</i>	Point count (with modifications)	110 hours	Cavarzere et al. (2009)
Gália	No	<i>Penelope superciliaris</i>	Transects for counting species and individuals and recordings	14 months	Cavarzere et al. (2012)
Gália	No	<i>Penelope superciliaris</i>	Point count	15 months	Cavarzere et al. (2009)
Gália	No	<i>Penelope superciliaris</i>	Literature review	-	São Paulo (2005)
Itapetininga	No	<i>Penelope superciliaris</i>	Point count	80 hours	Donatelli et al. (2007)
Itirapina	Yes	<i>Penelope superciliaris</i>	Observations not systematized, systematic fixed points	580 hours	Motta-Junior et al. (2008)
Itirapina	No	<i>Penelope superciliaris</i>	Fixed point and observation	12 months	Telles & Dias (2010)
Itirapina	Yes	-	Transects and points count	4 months	Kanegae (2011)
Itirapina	Yes	-	Systematized transects, observation and point count	12 months	Fieker et al. (2013)
Jardinópolis	No	<i>Penelope sp.</i>	Observation	27,8 hours	Chiarello (2000)
Junqueirópolis	Yes	<i>Crax fasciolata</i>	Non-linear transects, observations, audition and recording of vocalizations	-	São Paulo (2010)
Lençóis Paulista	No	<i>Penelope superciliaris</i>	Point count	11 months	Donatelli et al. (2004)
Luis Antônio		<i>Penelope superciliaris</i>	Transects, observations and point count	920 hours	Almeida (2002)
Luiz Antônio	No	<i>Penelope superciliaris</i>	Transects, observations and point count	920 hours	São Paulo (2013)
Paraibuna	No	-	Observation and fixed point	80 hours	Rossano & Almeida (2002)
Patrocínio Paulista	No	-	Qualitative sampling by the points method	11 months	Pozza & Pires (2003)
Porto Ferreira		<i>Penelope superciliaris</i>	Observations, audition and recording of vocalizations	35 hours	São Paulo (2003)
Rio Claro	No	<i>Penelope superciliaris</i>	Play-back	353 hours	Gussoni (2007)
Santa Rita do Passa Quatro		<i>Penelope superciliaris</i>	Observations and literature review	-	São Paulo (2009)
São Carlos	Yes	<i>Penelope superciliaris</i>	Observations through transects, point count, net captures and sporadic visits	10 years	Motta-Junior & Vasconcellos (1996)
São Carlos	Yes	-	Observation and photographic records	72 hours	Mercival & Galleti. (2001)
São João do Pau D'Alho		<i>Crax fasciolaata</i>	Non-linear transects	-	São Paulo (2010)
Teodoro Sampaio		<i>Penelope superciliaris</i>	Observations, transects and literature review	-	São Paulo (2006)

September and October 2013; a female and a male were also recorded together in three distinct days (Figure 2). The individuals were recorded early in the morning (from 06h27 to 07h35) and at sunset (17h26) in 2011, as well as in the afternoon (from 16h36 to 18h01) in 2013. All records were in the same trapping stations (20° 12' 10" W, 47° 25' 02" S and 20° 11' 58" W, 47° 24' 34" S). In addition, in the early morning of November 2013, a male Bare-faced Curassow was seen perching on a tree (approximately 20° 12' 49" E, 47° 25' 32" S). All records were obtained near a river in an area of closed canopy and understory, typical of Deciduous Alluvial Forest (Figure 3). This area is difficult to access, and are the most preserved area of the park.



Figure 2. Individuals of *Crax fasciolata* in the Furnas do Bom Jesus State Park. (a) A couple of *Crax fasciolata* recorded in 2011 and (b) a male recorded in 2011.

We found 23 studies about birds in Cerrado of state of São Paulo besides eight protected area management plans with birds species list (Table 2). We just record bare-faced curassow in two protected areas, at Aguapei State Park and Rio do Peixe State Parque (Figure 4).

Discussion

We expected to find bare-faced curassow in larger protected areas. However, despite having used larger sampling effort in larger protected areas we did not recorded the species in Jataí, an area that, if considered together with the contiguous Experimental Station of Luís Antônio, is almost 15.000ha. The bare-faced curassow was recorded only at the Furnas do Bom Jesus State Park, a relatively small park in the Cerrado biome (Rodrigues 2008).

It is surprising to find this animal in such a small and relatively isolated area in the north of the State since this species seems to be positively influenced by forest size (Nunes 2015). The occurrence of bare-faced curassow in that park may be facilitated by the presence of several native vegetation remnant in the region which may allow individuals coming from other areas such as the nearby Serra da Canastra National Park to recolonize the area.

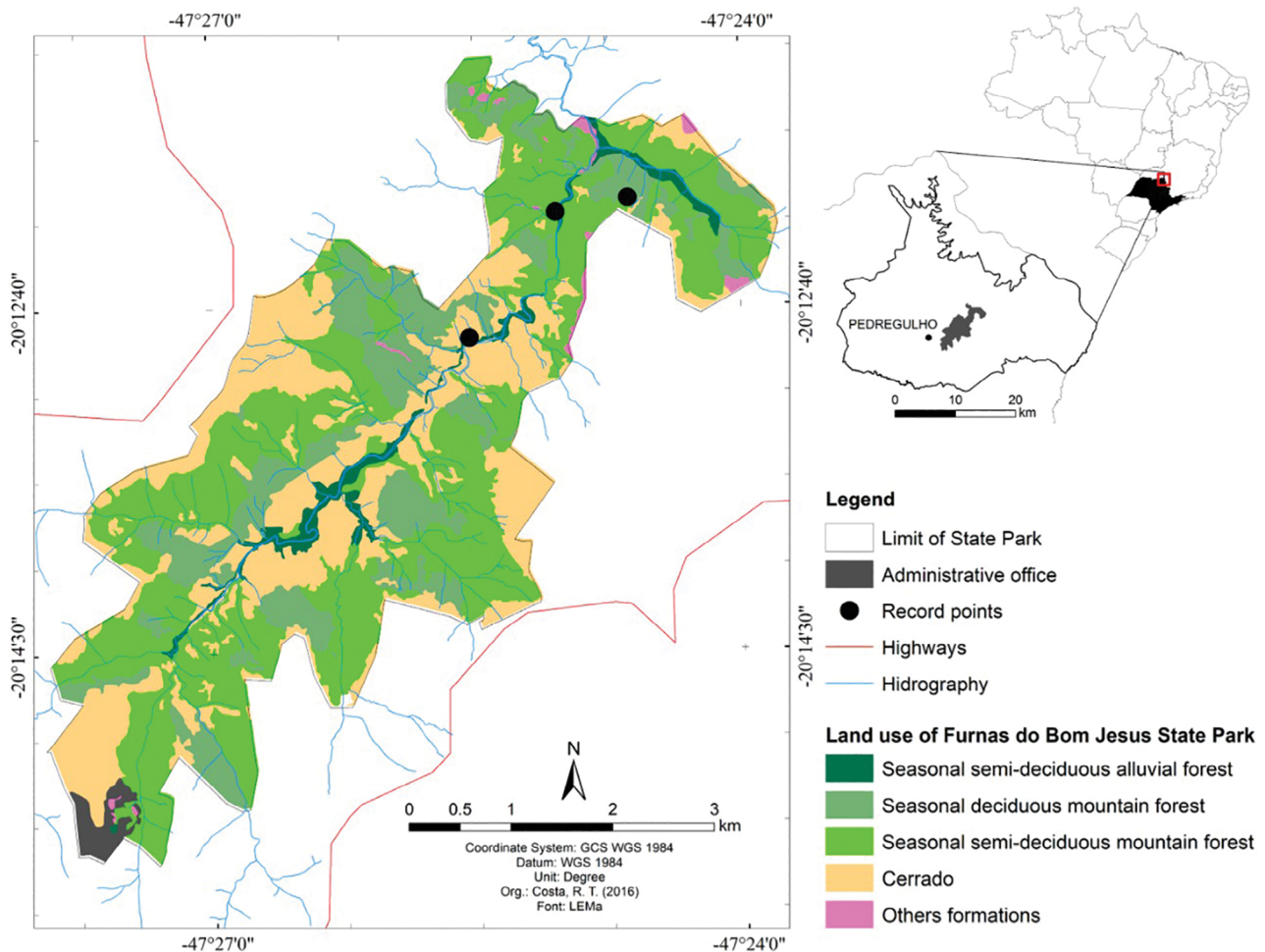


Figure 3. Record locations of *Crax fasciolata* in the Furnas do Bom Jesus State Park.

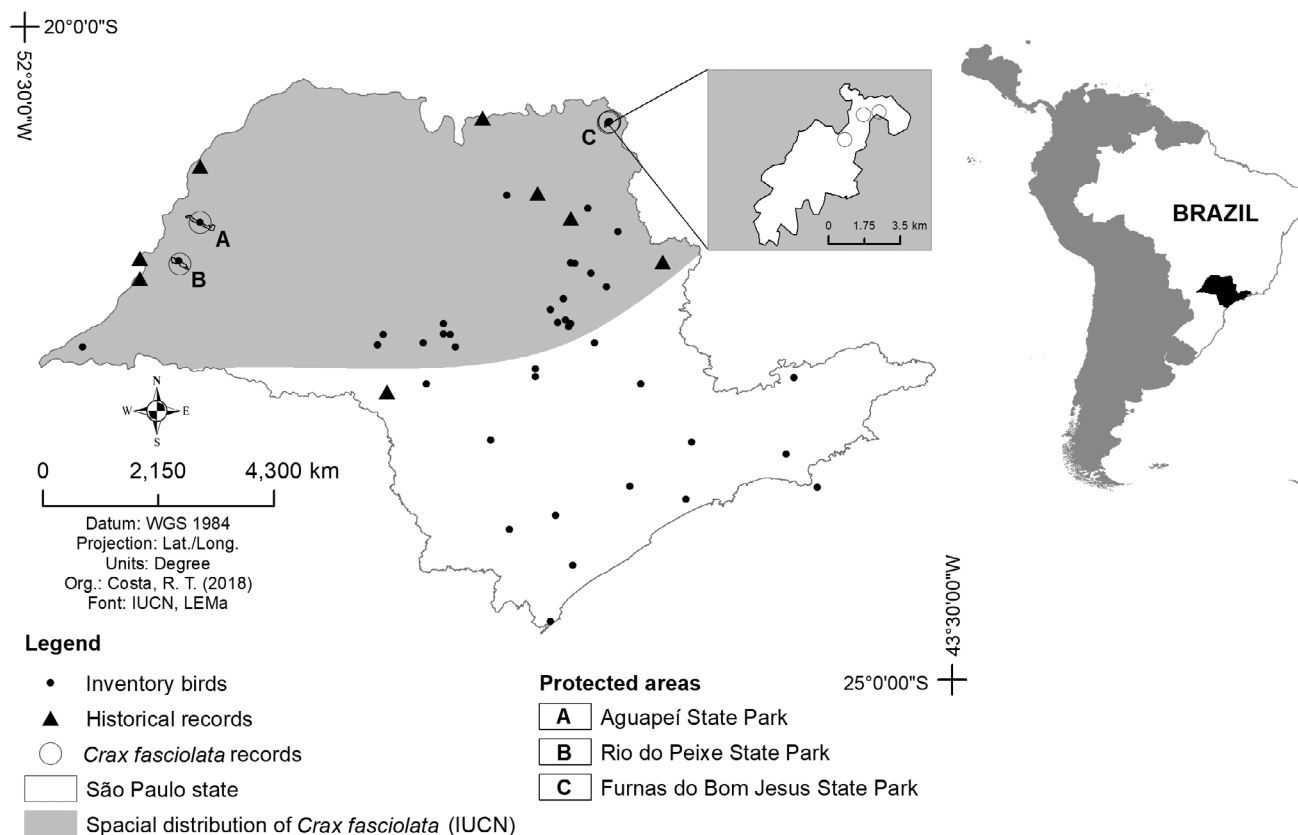


Figure 4. Confirmed records of bare-faced curassow in São Paulo State.

The assemblage of birds in the São Paulo State has been affected by forest fragmentation and poaching pressure. Poaching on cracids, for instance, has been considered a strong pressure to wildlife in the State of São Paulo (Uezu et al. 2005, Develey & Metzger 2006, Uezu 2006, Martensen et al. 2008). As a result of such anthropic pressures, São Paulo is the Brazilian state with the highest number of threatened and locally extinct bird species (Silveira & Uezu 2011).

Although we have opted not to use information of WikiAves (a Brazilian birds database), it is important to notice that there are 65 records of *C. fasciolata* in the state according to this database (<http://www.wikiaves.com.br>; accessed on 23 June 2016). Although these cannot be considered official records, they highlight the paucity of studies in the state. In addition, as the records are listed at the municipality level, in most cases it is not possible to identify whether they occurred in protected areas or not. Moreover, some of photographic records available on WikiAves show individuals in yards or having leg rings indicating that the animal may have been introduced to the area. This information is important, given that animals seen at unprotected areas are certainly under higher risk of dying due to poaching and roadkilling.

Furthermore, the fact that animals were recorded during two years (2011 and 2013) may indicate that a (small) population may be persisting locally at Furnas Park. It also raises the possibility of the species to occur in larger protected areas in the region, even though we have not detected it in the largest surveyed areas as Jataí and Santa Bárbara.

In 1993 the bare-faced curassow was considered a disappearing species in the São Paulo State (Willis & Yoshika Oniki 1993); at that time, it was present in the Paulo de Faria Ecological Station, an area of 435.73 ha in the northwest area of the state, and nearby the Aguapeí State Park, a 9,043.97 ha reserve located at the northwest of São Paulo that encompasses part of a large floodplain and contains large portions of riparian forests. Despite being considered almost extinct in the state (Silveira et al. 2009), the occurrence of the bare-faced curassow was recently recorded in the Aguapeí State Park (Secretaria de Meio Ambiente de São Paulo 2010), which might possibly represent a remaining population.

The record of *C. fasciolata* in the Furnas do Bom Jesus State Park highlights the importance of conserving even relatively small remnants of native vegetation, especially considering that there is only 0.5% of Cerrado protected in the São Paulo State (Klink & Machado 2005). The Furnas do Bom Jesus State Park had 30% of its area destroyed by a fire in late 2011. Fires may be a threat to many cracids species (Brooks 2006), including locally rare ones such as the bare-faced curassow; this is especially true in small protected areas where curassow populations are probably small. Other threats in the area are feral pigs (*Sus scrofa*) and free-ranging dogs (*Canis familiaris*) that were also recently recorded in our surveys. These species can prey on juvenile and adult birds (Ritchie et al. 2014). In addition, the records were obtained in the most preserved area of the park, which might be important for the conservation plan and management of the park. Although surveys

of avian fauna in this region are still relatively scarce (Cavalcanti & Joly 2002, Silva & Bates 2002, Develey et al. 2005, Piratelli & Blake 2006) additional studies focusing on mapping the present occurrence of the bare-faced curassow are urgent. Moreover, estimating numbers, connectivity, and factors impacting the populations are the basis for any conservation effort.

The new record of *C. fasciolata* highlights the usefulness of camera traps for bird surveys, since one can obtain information regarding the life history of curassow, as reported recently by Srbek-Araujo et al. (2012) and Fernandez-Duque et al. (2013). Camera traps are usually used for recording medium to large-sized terrestrial mammals and occasional records of other groups might be put aside by mammalogists. Despite this, camera trapping are also appropriate for large, ground-dwelling birds, such as cracids and pheasants (O'Brien & Kinnaird 2008). We recommend close collaboration between mammalogists and other specialists (e.g. ornithologists and herpetologists) so that non-mammal species recorded by camera traps can be promptly identified and records made available to the scientific community.

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Author Contributions

Ana Paula Nascimento Gomes: Contribution to data collection. Contribution to data analysis and interpretation. Contribution to manuscript preparation. Contribution to critical revision, adding intellectual content.

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Conflict of Interest

We declare that we have no conflict of interest related to the publication of this manuscript.

Ethics

Approval by an ethical committee was not required, since this study was conducted using camera traps only. No invasive methods were used.

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