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SHORT-COMMUNICATION

Rediscovery of the Harpy Eagle *Harpia harpyja* (Accipitriformes: Accipitridae) for Rio Grande do Sul state, Brazil

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ABSTRACT: This paper describes three records evidencing the presence of Harpy Eagle (*Harpia harpyja*) in Turvo State Park, Rio Grande do Sul, Brazil. Besides an historical record showing a picture of a young Harpy Eagle shot in the 1970's in the surroundings of Turvo State Park, we also describe two recent records made inside the park. One of them was visual, made at the Yucumã Waterfalls in 2011 by the Argentinean park ranger V. Matuchaka. The other one, documented by a picture, was made by D.A.M. in March 2015 next to a remote valley of the park. These records proof the Harpy Eagle still occurs in Rio Grande do Sul state and highlights the project of Panambi's Hydroelectric should be redesigned to minimize impacts on the area of Turvo State Park.

KEY-WORDS: Atlantic Forest, Panambi Hydroeletric, raptors, Turvo State Park, Yucumã Waterfalls.

From physical aspect the Harpy Eagle, *Harpia harpyja* (Linnaeus, 1758) is the most formidable raptor in the world (Brown & Amadon 1968). It is highlighted as the most powerful aerial hunter in tropical forests of new world, hunting arboreal mammals as big as capuchins (*Cebus*) and howlers (*Alouatta*) monkeys (Peres 1990, del Hoyo *et al.* 1994). The species inhabits lowland forests, ranging from southern Mexico south to eastern Bolivia, southern Brazil, and extreme northern Argentina (Brown & Amadon 1968). Besides its wide distribution, the Harpy Eagle has disappeared from large parts of its former range; in Brazil, it is reasonably common only in Amazonia, being very rare or even extinct elsewhere (del Hoyo *et al.* 1994, Sick 1997, Soares *et al.* 2006).

Recent records (after 1980) of Harpy Eagle in the Brazilian Atlantic Forest are scarce and now restricted to the large remaining forests, which are also scarce. Most of these records are from the states of Bahia and Espírito Santo (Galetti *et al.* 1997, Pacheco *et al.* 2003, Silveira *et al.* 2005, Srbek-Araujo & Chiarello 2006, Vargas *et al.* 2006, Sánchez-Lalinde *et al.* 2011, Aguiar-Silva *et al.* 2012, Novaes *et al.* 2010), but there are also records for the states of Minas Gerais, Rio de Janeiro and São Paulo (Galetti *et al.* 1997, Marigo 2002, Pacheco *et al.* 2003, Vargas *et al.* 2006). In southern Brazil there are a few recent records, and they are restricted to the states of Paraná and Santa Catarina (Albuquerque 1995, Scherer-Neto & Ribas 2004), without any recent confirmed observation for Rio Grande do Sul. Most recent records for southern Atlantic Forest comes from Misiones, Argentina, where there are also observations of nests (Anfuso *et al.* 2008, Chebez 2008).

In Rio Grande do Sul (RS) there are six historic records of Harpy Eagle known in the literature. They consist of six specimens which were shot in the state before 1940, which are now deposited in different museums of RS and Santa Catarina (Bencke *et al.* 2003, Favretto 2008). The actual occurrence of Harpy Eagle in RS was speculated both by Belton (1994) and Bencke *et al.* (2003), who suggested the mostly appropriated area for encounters would be the Turvo State Park ("Parque Estadual do Turvo" - PET), in Derrubadas municipality. These assumptions were mostly based on Misiones records, where there are records in areas next to PET (Chebez 2008). Moreover, there are some doubtful observations in PET as well (Guadagnin & Menegheti 1994, Bencke *et al.* 2003). However, the lack of confirmed records makes the Harpy Eagle to be regarded as extinct for long time in RS.

We have reported three records of Harpy Eagle in PET, one historical and two recent[1], confirming its actual occurrence in RS. The first one comes from an event occurred in the surroundings of PET, where a young Harpy Eagle was shot by dwellers in the locality of Desimigrados, in Derrubadas municipality (27°15'S; 53°54'W) in the 1970's (Figure 1). This fact is well known by the elders living in Derrubadas, once a note was published in a local journal named "Jornal da Terra", in Tenente Portela municipality (N. Martens, pers. comm.). We gathered the details of this record and the photo, but we could not find the original note. The second record was made on 31 January 2011 in PET, when a Harpy Eagle was perched by the morning in an *Apuleia leiocarpa* aside the Yucumã Waterfalls, in the Brazilian side of the Uruguay River (27°8'S; 53°53'W). This record was based only on visual observations, made by an Argentinean park ranger with experience on the local avifauna, who described the bird as a probable female, due to its huge size (V. Matuchaka, *in litt.*). The third record was made by D.A.M. in 23 March 2015, when an adult Harpy Eagle, probably a male, was observed and photographed also at an *Apuleia leiocarpa* (Figure 2). The bird was perched aside the road that takes to Salto do Yucumã Waterfalls, inside PET (27°12'S; 53°51'W). It was observed for a few minutes before it flew off into the direction of a valley in one of the most remote areas of PET.

The Harpy Eagle is the largest raptor in the forests of South America. Nonetheless, its presence is hard to be detected, due to its secretive behavior (Thiollay 1989, Seipke & Cabanne 2002, Soares *et al.* 2006). Different from other raptors, the Harpy Eagle rarely soars, flying mostly below the canopy (Brown & Amadon 1968, Ferguson-Lees & Christie 2001). This is why traditional methods of surveying birds of prey do not work with Harpy Eagles, and could explain its absence in raptors surveys made in PET by Meller (2011). Although the Harpy Eagle can be hard to find, it is occasionally conspicuous while sunbathing on exposed perches in early morning (Thiollay 1989, del Hoyo *et al.* 1994). The record from 2011 could be made at this condition, but the observer also related that there was a great abundance of birds in the bed of the Uruguay River, because the level of the water was decreasing fast in response to hydroelectric operation (V. Matuchaka, *in litt.*). Thus, the Harpy Eagle could be still-hunting from the tree. This still-hunting behavior was already observed by D.A.M. for the Ornate Hawk-Eagle (*Spizaetus ornatus*) in the area of Yucumã Waterfalls at similar conditions (D. A. M., pers. obs.). The 2015 record was made just before

FIGURE 1. A young *Harpia harpyja* shot in the 1970's in the surroundings of Turvo State Park, Derrubadas, Rio Grande do Sul state, Brazil. Image provided by A. Biguelini.

[1] After the paper was issued, the Harpy Eagle was seen again in Turvo State Park in 26 June 2016 by D.A.M. and Ataiz C. de Siqueira. The eagle - probable a male - was flying slowly over the canopy forest and then perched on a tree aside the road that leads to Salto do Yucumã Waterfalls, in a place known as "Cascalho" (27°11'26"S; 53°50'39"W). At the time the eagle perched, some Black-horned Capuchins started to produce aggressive sounds. Soon the eagle flew off and was not seen anymore. This is the fourth confirmed record of the Harpy Eagle inside the Turvo State Park.

FIGURE 2. An adult *Harpia harpyja* photographed on 23 March 2015 at Turvo State Park, Derrubadas, Rio Grande do Sul state, Brazil. Photo: D. A. Meller.

sunset, and the eagle apparently was still-hunting Azara's Agouties (*Dasyprocta azarae*), which were noising on the forest ground. In Misiones, Argentina, Opossums (*Didelphis* spp.), Tayras (*Eira barbara*) and Hairy Dwarf Porcupines (*Coendou spinosus*) are known prey of the Harpy Eagle (del Hoyo *et al.* 1994). Also Black-horned Capuchins (*Sapajus nigritus*) have been reported (Anfuso *et al.* 2008). All these mammals are found in PET, and some of them are quite common (Kasper *et al.* 2007, D.A.M., pers. obs.). Nevertheless, hunting pressure that occurs in PET may affect prey populations on which the Harpy Eagle bases its diet (Thiollay 1989, del Hoyo *et al.* 1994, Bencke *et al.* 2003, Silva *et al.* 2005).

Even though the presence of the Harpy Eagle in PET was long expected, these are the first confirmed records ever made. However, two doubtful records in literature could also be of Harpy Eagle. One was made by E. Albuquerque, who reported an observation in 1982, in the Yucumã Waterfalls (Guadagnin & Menegheti 1994, E. Albuquerque, *in litt.*). This record could be questioned because it describes two Harpy Eagles flying at high altitude (see Guadagnin & Menegheti 1994). Other records that describe similar behavior were those reported by Albuquerque (1995) at Serra do Tabuleiro, in Santa Catarina. Although unusual, and even questionable, this could be a behavior presented by the species in rare occasions. In the interactive website dedicated to the Brazilian community of birdwatchers (www.wikiaves.com.br) there is at least one picture showing high soaring behavior. The record made in Bodoquena, Mato Grosso do Sul, by M. Martins (catalogue number 1369622) shows an adult Harpy Eagle apparently soaring at fairly high altitude (Martins 2014). The other doubtful record made in PET is from a nest in a remote place inside the park, observed by the park ranger I. dos Santos in the 1980's (Guadagnin & Menegheti 1994, Bencke *et al.* 2003, I. dos Santos, pers. comm.). There are at least four other reports made by local people, which we treated as uncertain and do not present here, understanding that anyone without the proper knowledge and equipment (binoculars) may not recognize the different forest eagles that occur in the area.

According to Soares *et al.* (2006), and now including PET, the Harpy Eagle has recent records in 18 areas in the Brazilian Atlantic Forest. In addition, these authors also consider the possibility of being found in Iguaçu National Park, Paraná. Bierregaard-Jr. (1995) observes that the Harpy Eagle could have some local populations in decline, and the main reasons are hunting and deforestation (del Hoyo *et al.* 1994). This probably explains the critical situation that Harpy Eagle faces in Atlantic Forest nowadays. The species became so rare that

the only recent documented records are from Espírito Santo, Bahia and Misiones, Argentina (Anfuso *et al.* 2008, Chebez 2008, Sánchez-Lalinde *et al.* 2011, Aguiar-Silva *et al.* 2012). In this context, the picture made in 2015 in PET is unprecedented for southern Brazil. The first two records reported by us were given to the process of revision of threatened fauna in RS, which converted the status of Harpy Eagle from "probably extinct" to "critically endangered" (FZB 2013). The Harpy Eagle shot in the 1970's reminds other historical records of Harpy and Crested Eagle *Morphnus guianensis* (Daudin, 1800) in RS (Bencke *et al.* 2003), where young and inexperienced birds were close to proprieties, probably trying to hunt domestic animals. This could be a threat for the species in the future, especially if it is nesting in the area. The supposed Harpy Eagle nest found in the 1980's was at a different place, but in the same valley in which the bird recorded in 2015 flew into. Not far from this place, there are some slopes with the same characteristics of the known nests of Harpy Eagles in Misiones, Argentina, and also similar to the one found in PET in the 1980's. In general, the nests in Misiones were at the lower slopes of deep valleys facing southward (E. Krauczuk, *in litt.*). Therefore, if the species is really nesting in PET, it could be expected that immature birds wandering in search of territories could reach the edge of the park. Educational programs should be conducted in the region to prevent Harpy Eagles to be killed by dwellers.

The presence of Harpy Eagle indicates once more the relevance that PET has in conserving biodiversity in RS, as the species can only be found in well preserved areas. The species is considered to be even more demanding than jaguars (Chebez 2008), which are also present in the area (Kasper *et al.* 2007). The probably reason to the Harpy Eagle still be found in PET is the connection that this park has with the large forests of Misiones, Argentina. Together with Misiones and Iguaçu National Park, PET is included in an area which has about one million ha of well-preserved forests (Bencke *et al.* 2006). Aside to PET is the Yabotí Biosphere Reserve, which in spite of being a large continuous forest, much of its area are private proprieties, allowing selective logging (Bodrati *et al.* 2005, Anfuso *et al.* 2008). This kind of exploitation tends to scarce emergent trees, which include the ones used by Harpy Eagles for nesting. Most nests studied in Misiones were built in trees of the species *Enterolobium contortisiliquum*, and one was in a *Tabebuia heptaphylla* (Chebez 2008). The tree of the supposed Harpy Eagle nest in PET was a *Cordia trichotoma* (I. dos Santos, pers. comm.). Some of these emergent trees not only are used for nesting, but also characterize the kind of canopy that Harpy Eagles requires. Because PET is not under logging since 1948 (Silva *et al.* 2005), the habitat could be more appropriated for the species that some areas of Yabotí Reserve (E. Krauczuk, *in litt.*). This is why the species could occupy temporarily or even be resident at PET.

The project of Panambi's Hydroelectric continues to be a threat for PET (Bencke *et al.* 2006). At the quota of 130 m the project assumes to flood important areas of the park and disconnect its forests from those of Misiones. Because it will cause loss of habitat and isolation of PET from Yabotí Biosphere Reserve, we consider this the most imminent threat to the survival of Harpy Eagle in RS. Impacts would affect not only the Harpy Eagle itself, but also its prey. Thus, the project must be redesign in a quota that Panambi's Hydroeletric does not reach PET, other way its implementation could account for the extinction of the Harpy Eagle in RS.

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