



## NON-PASSERIFORMES BIRDS SPECIES OF THE PARAGUAY RIVER, PANTANAL WETLAND, CÁCERES - MT BRAZIL

### ORIGINAL ARTICLE

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### ABSTRACT

The Pantanal has about 730 bird species, of about 80 are aquatic birds, being the richest and abundant region with aquatic birds of the continent. This study was realized with the aim to register the occurrence and distribution of the birds, over 140 km of the Paraguay river, between the urban area of Cáceres-MT county and Descalvados farm, and in 13 parental lakes over the Rivers. The samples were realized by boat with constant speed, all the individuals observed or heard were registered. It was registered in total 177 species of non Passeriformes birds in the Paraguay river and 13 parental lakes. In the excerpt RIOIII of the Paraguay river was registered bigger diversity, between the lake, BJCRE shown bigger richness. It was evidenced the importance of the area by the elevated number of registered species.

Key-words: birds, diversity, lakes, Pantanal.

### 1. INTRODUCTION

In the context of singularity, conservation and priority, Olson *et al.* (1998) consider the Pantanal as “with global accent, vulnerable and with high priority for conservation



on a regional scale". The existing data of biological diversity of the Pantanal are small and fragmented yet (NUNES; SILVA and FERRAZ, 2017).

The fragile balance of the Pantanal ecosystem, maintained by the flood pulse (JUNK *et al.*, 1989), are threatened by the new direction of the economic politics. Navigation on the Paraguay River, highways and dam building are the main troubles within of the Pantanal. Before another factor like deforestation (SILVA *et al.*, 2015; SEIDL; SILVA and MORAES, 2001), change on the hydraulic geometry of the rivers, change the natural vegetation on the head waters (SILVA *et al.*, 2000; NUNES *et al.*, 2000)

The Pantanal is the region with high number of aquatic birds in the continent (SICK, 1997). Research estimate about 730 species in the region, including migratory birds, accidental visitors and introduced species, being about 500 species in the region (SILVA *et al.*, 2000; VITORINO *et al.*, 2017; ENDRIGO; PIVATTO and BERNARDON, 2012; STRAUBE e PIVATTO, 2012; NUNES *et al.*, 2020; QUEIROZ *et al.*, 2021).

The purpose of this research is registration the occurrence and distribution of the birds into the different environments of the Paraguay River and parental lakes, between the urban area of the Cáceres city to the Descalvados farm (140 km).

## **2. MATERIAL AND METHODS**

### **2.1 STUDY AREA**

The Pantanal of Mato Grosso state is situated in the western of Brazilian territory, in the Mato Grosso and Mato Grosso do Sul states. Is a depression floodable seasonally, fully contained in the drainage watershed of the Paraguay River and comprises about 140.000 Km<sup>2</sup> (BRASIL, 1982) (Figure 1).

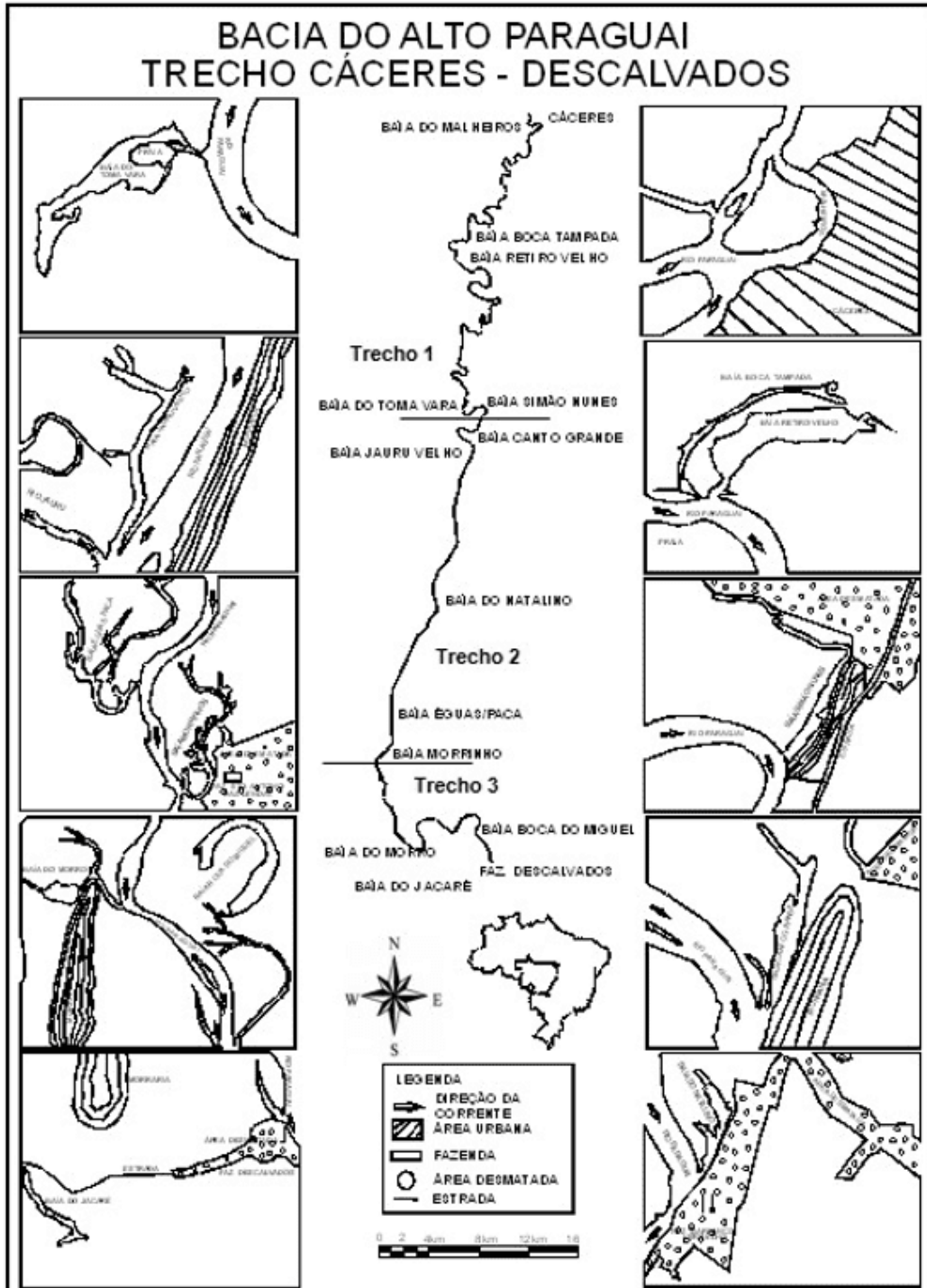
The field samples were carried out along the Paraguay River, from the urban area of the Cáceres municipality to the Descalvados farm, traversing 134km of river,



between may/2008 to may/2009, trying to sample on all hydrologic periods (Figure1). It was divided into three snippets, being RIO I, characterized like a highly meandric, located between *Caceres* city to the *Canto Grande* lake, RIO II shown the most straightened river and more wide, located between *Canto Grande* lake and *Das Éguas/Paca* lakes, the snippets RIO III is the transition of straightened to plain and is located between *Das Éguas/Paca* lakes to *Descalvados* farm. Surveys were carried out also in 13 parental lakes of the Paraguay River.

The samples collect were realized using boat (25hp, 2t, Yamaha), by medium speed of 15 km/h in the river and lakes. To observation it was used binoculars (7 x 50 mm) and photographic register by means of a digital camera Canon Rebel XTi, with 12 mega pixel. The sample points were marked using GPS, Garmim etrax vista. The nomenclature used followed NBRO (2014).

Figure 1. Study area at the Paraguay river, from Cáceres municipality to Descalvados Farm, Cáceres - MT. Drowned by Landsat, 2008. SEMA-MT



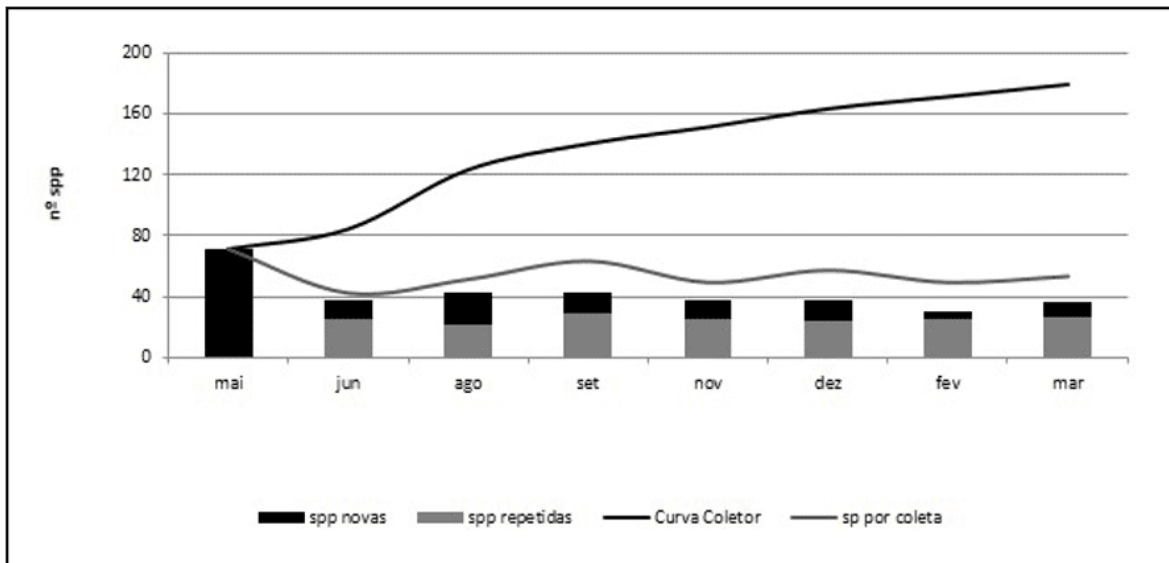
Source: authors.

### 3. RESULTS AND DISCUSSION

During sample collects, it was registered 177 species distributed on 21 orders and 42 families, totalizing 480 hours of observation. This is the first systematic survey in this area.

The figure 2, show new species on each collect, repeated species per collect, species cumulative curve, and the number of species per collect on the study area, evidences the tendency to stabilization. Although is it possible to exists not sampled species in the region, we believe that the survey was satisfactory, because the kind of environment mainly aquatic or riverine not shown a bigger variation.

Figure 2. Species cumulative curve at the Paraguay River, from Caceres municipality to *Descalvados* farm, Pantanal of Caceres - MT



Source: authors.

Nunes; Tomas and Ticianeli (2005), studying the Nhumirin farm on the Pantanal of Nhecolandia, identify 272 species including passeriformes and non passeriformes. Tubelis and Tomas (2003) published a list with 465 species of passeriformes and non passeriformes for the Pantanal and surrounding area, Pessoa *et al.* (2013) found



169 species studying passeriformes and non passeriformes in the Paragay river in the *Barra do Bugres* municipality.

In the PCBAP (BRASIL, 1997) it were identified 656 bird species on the Pantanal matogrossense for the states of Mato Grosso and Mato Grosso do Sul, being that it was visited ten localities, for theses authors the number of bird species can reach 700.

Of the 21 orders found, Falconiformes showed 24 species being that the total of the species for this order in Brazil is of 69. In this research it was found 35% of this amount, Nunes; Tomas and Ticianeli (2005), Nunes; Silva and Dias Filho (2012a), Nunes *et al.* (2020a; 2020b), Fieker *et al.* (2013) e Farias *et al.* (2015) found the same standard, studying the Pantanal of Mato Grosso do Sul and the same area and Nunes *et al.* (2018) studding the wetlands of Guaporé River.

For the Ciconiiformes it was identified 21 species. The Brazil had 36 species of this order, being that for the Pantanal region, it was found 66% of this amount, because the biggest part of the species of this order, are aquatic bird, and this is the main environment in the region, allowing that those species to be very common in the Pantanal.

The Psitaciformes showed 16 species, being that the total number for Brazil is of 84, so in this study it was observed 18% of these species. Columbiformes was the fourth order in number of species (13), being that, the total for Brazil is 22 species, reaching 60% on this research.

The orders who shown the small number of bird species were, Struthioniformes with one specie, Pelecaniformes with two species. Podicepediformes showed two species. Trogoniformes two species and Galbuliformes three species.



We registered the following orders Psittaciformes, Pelecaniformes, Ciconiiformes, Cathartiiformes, Coraciiformes, Columbiformes, Galliformes, Cuculiformes and Falconiformes in all sample points.

The most representative families were Psittacidae with 16 species, totalizing 18% of the total, which reach 84 species. Accipitridae with 15 species totalize 34% of the total of species of this family, which in Brazil is about 45 species. It were found 14 species belonging to the Ardeidae family, in the Brazil the number os species belonging to this family is of 21 species, being that the species found in this study, make up 67% of this total.

The families Psittacidae, Phalacrocoracidae, Anhingidae, Ardeidae, Cathartidae, Alcedinidae, Columbidae, Cracidae and Accipitridae were observed on all samples points.

The table 2 shown a list of species as well as their distribution per sample unit, though the presence absence of the individulas into the localities, totalizing 177 species, distributed unto the 16 samples points, along Paraguay River to Descalvados farm.

The major influence in the bird fauna in the Pantanal is certainly the Cerrado biome, being this contributes with the biggest part of the species found, this due to the occurrence of a typical vegetation of Cerrado into the Pantanal. Another factor that favors the presence of species from Cerrado, including the endemics one, is the low endemism in the Pantanal (FROTA *et al.*, 2020a; FROTA *et al.*, 2000b; VITORINO *et al.*, 2018; NUNES; SILVEIRA and SILVA, 2012; NUNES and TOMAS, 2004).

Table 1. Registered species on all sample points along of Paraguay River and the parental lakes

Taxa Name	Popu lar name	B M H	R I O	B B T V P	B R T V L	R I O I I	B T V R	B S M N N	R I O I I I	B C T G D	B J R V L	B B C N T	B E P C	B M O R I	B M O R O	B B C M G	B J C R E
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RHEIFORMES Forbes, 1884																				
Rheidae Bonaparte 1849																				
<i>Rhea americana</i> (Linnaeus 1758)	Ema																			
TINAMIFORMES Huxley 1872																				
Tinamidae Gray 1840																				
<i>Crypturus parvirostris</i> (Wagler 1827)	Nhamboxoró																			
<i>Crypturus tataupa</i> (Temminck 1815)	Inhambuçintã																			
<i>Crypturus undulatus</i> (Temminck 1815)	Jaó																			
<i>Rhynchotus rufescens</i> (Temminck 1815)	Perdiz																			







us 1758)																	
<i>Dendrygna bicolor</i> (Vieillot 1816)	Marr eaca- nel eira																
<i>Dendrocygna viduata</i> (Linnaeus 1766)	Irerê																
GALLIFORMES Linnaeus 1758																	
Cracida de Rafinesque 1815																	
<i>Crax fasciolata</i> Spix 1825	Mutu m pinim a																
Taxa Name	Popu lar name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E
<i>Ortalliscanicollis</i> (Wagler 1830)	Arac uã- do- papnt anal																
<i>Penelope ocrogaster</i> Pelzein 1870	Jacu- barri ga- casta nha																
<i>Aburriacujubi</i> (Pelzeln 1858)	Cuju bi																



<i>Aburria cumane nsis</i> (Spix 1825)	Jacutinga																			
PODIC EPEDIFORMES Furbring 1888																				
Podicipedidae Bonaparte 1831																				
<i>Podilymbus podiceps</i> (Linnaeus 1758)	Mergulhão caçador																			
<i>Tachyaptus dominicus</i> (Linnaeus 1766)	Mergulhão zinho																			
CICONIFORMES Bonaparte 1854																				
Ciconiidae Sundevall 1836																				
<i>Ciconia maguari</i> (Gmelin 1789)	Tabaiaia, maguari																			
<i>Jabiru mycteria</i> (Lichtenstein 1819)	Tuiuiú																			



<i>Mycteria americana</i> (Linnaeus 1758)	Cabeça-seca																	
SULIFORMES Sharpe 1891																		
Anhinga dae Reichenbach 1849																		
<i>Anhinga anhinga</i> (Linnaeus 1766)	Biguatinga, biuá																	
Phalacrocoracidae Reichenbach 1849																		
<i>Nannopterum brasilianus</i> (Gmelin 1789)	Biguá																	
PELECANIFORMES Sharpe 1891																		
Ardeidae Leach 1820																		
<i>Ardea alba</i> Linnaeus 1758	Garça-branca-grande																	



<i>Ardea cocoi</i> Linnaeus 1766	maguari, garçamour a																	
<i>Botaurus pinnatus</i> (Wagler 1829)	Socó boi baio																	
<i>Bubulcus ibis</i> (Linnaeus 1758)	Garça vaqu eira																	
Taxa Name	Popu lar name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E	
<i>Butorides striata</i> (Linnaeus 1758)	Soco zinho																	
<i>Cochlearius cochlearius</i> (Linnaeus 1766)	Arap apa																	
<i>Egretta caerula</i> (Linnaeus 1758)	garci nha azula da																	
<i>Egretta thula</i> (Molina 1782)	Garça- pequ ena																	
<i>Nycticorax nycticorax</i> (Linnaeus)	Socó dormi nhoco																	



us 1758)																		
<i>Pilherodrius pileatus</i> (Boddaert 1783)	Garça real																	
<i>Syrigma sibilatrix</i> (Temminck 1824)	Maria Faceira																	
<i>Tigrisoma lineatum</i> (Boddaert 1783)	Socó boi																	
<i>Zebrilus undulatus</i> (Gmelin 1789)	Socó- zigue- zague																	
Threski onitidae Poche, 1904																		
<i>Mesembrymbia cayennensis</i> (Gmelin 1789)	Franço d'água																	
<i>Phimosus infuscatus</i> (Lichtenstein 1823)	Tapicuru- carapela da																	
<i>Platalea ajaja</i> Linnaeus 1758	Colhereiro																	



<i>Theristocaudatus</i> (Bodder 1783)	Curica																						
<i>Theristocoerulescens</i> (Vieillot 1817)	Curica cinza , real																						
CATHARTIFORMES Seebom 1890																							
Cathartidae Lafresnaye 1839																							
<i>Cathartes aura</i> (Linnaeus 1758)	Urubu- caçador																						
<i>Cathartes burrovianus</i> Cassin 1845	Urubu- caçador																						
<i>Coragyps atratus</i> (Bechstein 1793)	Urubu- preto																						
<i>Sarcophaps papa</i> (Linnaeus 1758)	urubu- rei																						
ACCIPTRIFORMES																							



MES Bonaparte 1831																		
Pandionidae Bonaparte 1854																		
<i>Pandion haliaetus</i> (Linnaeus 1758)	Águia pescadora																	
Taxa Name	Popular name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E	
Accipitridae Vigors 1824																		
<i>Busarellus nigricollis</i> (Latham 1790)	Gavião-belo																	
<i>Rupornis magnirostris</i> (Gmelin 1788)	Gavião carijó																	
<i>Buteo nitidus</i> (Latham 1790)	gavião-cigarrão																	
<i>Buteo platypterus</i> (Vieillot 1823)	gavião de asa-larga																	
<i>Urubitinga urubitinga</i>	Gavião preto																	









ert 1783)																		
CARIA MIFOR MES																		
Cariami dae Bonapa rte 1850																		
Taxa Name	Popu lar name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E	
<i>Cariam a cristata</i> (Linnae us 1766)	Serie ma																	
Rallidae Rafines que 1815																		
<i>Aramide s cajaneu s</i> (Statiu s Muller, 1776)	Sara cura- três- potes																	
<i>Gallinul a galeata</i> (Lichten stein, 1918)	Fran go-d água																	
<i>Porphyri o martinic a</i> (Linnae us 1766)	Sara cura preta																	
<i>Mustelir allus albicollis</i>	joão canh																	







Taxa Name	Popular name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	B M O R R O	B B C M G	B J C R E
<i>Phaetusa simplex</i> (Gmelin 1789)	Taiamã																
<i>Sternula superciliosa</i> (Vieillot 1819)	Trinta-réis-anão																
Rynchopidae Bonaparte 1838																	
<i>Rynchos niger</i> (Linnaeus, 1758)	Talhamar																
COLUMBIFORMES Latham 1790																	
Columbidae Leach 1820																	
<i>Claravis pretiosa</i> (Ferrari-Perez 1886)	Pombado-mato																
<i>Columba livia domestica</i> (Gmelin 1789)	Pombodômico																
<i>Columbina minuta</i>	Rolinhassa-																





<i>Patagioenas speciosa</i> (Gmelin 1789)	Troca																	
<i>Urupelia campestris</i> (Spix 1825)	Rolinha vaqueira																	
<i>Zenaidauriculata</i> (Des Murs 1847)	Avoante																	
CUCULIFORMES Wagler 1830																		
Cuculidae Leach 1820																		
Cuculinae Leach 1820																		
<i>Coccyzus euleri</i> Cabanis 1873	Papagalargas-euler																	
Taxa Name	Popular name	B M L H	R I O I	B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E	
<i>Coccyzus melacoryphus</i> (Vieillot 1817)	Papagalargas																	









Caprimulgidae Vigors 1825																		
<i>Hydropsalis parvula</i> Gould, 1837	Bacuruauzinho																	
<i>Antrostomus rufus</i> (Boddaert, 1783)	João-cortapau																	
<i>Nannocordeus pusillus</i> (Gould, 1861)	Bacuruauzinho																	
<i>Hydropsalis torquata</i> (Gmelin 1789)	Curiangotésouira																	
<i>Nyctidromus albicollis</i> (Gmelin 1789)	Bacuruau																	
Taxa Name	Popular name	B M L H	R I O I	B B C P T	B R T V L	R I O I	B T M V R	B S M N N	R I O I	B C T G D	B J R V L	B B C N T	B E P C	B M O R R	BM OR RO	B B C M G	BJ C R E	
<i>Nyctiprocne leucopyga</i> (Spix 1825)	Curiangotepreto																	
<i>Podager nacunda</i>	Corucão																	







(Linnaeus 1758)	o-rubro																	
TROGONIFORMES AOU 1886																		
Trogonidae Lesson 1828																		
<i>Trogon curucui</i> (Linnaeus 1766)	Suru cuá-vernelho																	
Taxa Name	Popular name	B M L H	R I O I	B B C T P	B R T V L	R I O II	B T M V R	B S M N N	R I O III	B C T G D	B J R V L	B B C N T	B E P C	B M O R R I	BM OR RO	B B C M G	BJ C R E	
CORACIIFORMES Forbes 1844																		
Alcedinidae Rafinesque 1815																		
<i>Megasceryle torquata</i> (Linnaeus 1766)	Martim-pescador																	
<i>Chloroceryle aenea</i> (Pallas 1764)	Martim-pescador-anão																	
<i>Chloroceryle inda</i> (Linnaeus)	Martim-pescador																	





	a-preto																		
<i>Nystalus chacuru</i> (Viellot 1816)	João bobo																		
PICIFORMES Meyer & Wolf 1810																			
Picidae Leach 1820																			
<i>Campephilus melanoleucus</i> (Gmelin 1788)	Pica-pau-vermelho																		
<i>Celeus lugubris</i> (Malherbe 1851)	João-velho																		
<i>Colaptes melanochloros</i> (Gmelin 1788)	Pica-pau-verde																		
<i>Colaptes campestris</i> (Vieillot 1818)	Pica-pau-do-campo																		
<i>Dryocopus lineatus</i> (Linnaeus 1766)	Pica-pau																		
<i>Melanerpes candidus</i>	Pica-pau-																		





s (Otto 1796)	branco																	
Taxa Name	Popular name	BMLH	RI	BCPTP	BRITVL	RI	OTMVR	BSMNN	RI	OT	BC	JRVL	BCNT	BEPC	B	BMORRO	B	BJCRE
<i>Melanerpes cruentatus</i> (Boddaert 1783)	Benedicta-vermelha																	
<i>Piculus chrysoloros</i> (Vieillot 1818)	Pica-paudourado																	
<i>Picumnus albusquamatus</i> (D'Orbig 1840)	Pica-pau-anão - escamado																	
<i>Venillornis passerinus</i> (Linnaeus 1766)	Picapauzinho-anão																	
Ramphastidae Vigors 1825																		
<i>Pteroglossus castanotis</i> (Gould 1834)	Araçari-castanho																	
<i>Ramphastos toco</i> (Stenius)	Tucanuçu																	



Muller 1776)																						
FALCO NIFORMES																						
Falconidae Leach 1820																						
<i>Caracara plancus</i> (Miller 1777)	Carcará																					
<i>Falco deiroleucus</i> Temminck 1825	falção-peito-laranja																					
<i>Falco femoralis</i> Temminck 1822	falção-de-coleira																					
<i>Falco rufigularis</i> Daudin 1800	gavião-carijó, cauré																					
<i>Falco sparverius</i> Linnaeus 1758	Quiriquiri																					
<i>Herpetotheres cachinnans</i> (Linnaeus 1758)	Acauã, Pinhé																					
<i>Micratur semitorquatus</i>	Gavião relógio																					



(Vielliot 1817)																		
<i>Milvago chimachima</i> (Vieillot 1816)	Gavião pinhé																	
PSITTA CIFORMES Wagler 1830																		
Psittacidae Rafinesque 1815																		
<i>Amazona aestiva</i> (Linnaeus 1758)	Papagaio verdadeiro																	
<i>Amazona amazonica</i> (Linnaeus 1766)	Papagaio trombeiro																	
Taxa Name	Popular name	B M L H	R I O I	B B C T P	B R T V L	R I O I	B T M V R	B S M N N	R I O I	B C T G D	B J R V L	B B C N T	B E P C	B M O R R	BM OR RO	B B C M G	BJ C R E	
<i>Anodorhynchus hyacinthinus</i> (Lat 1790)	Ararauna																	
<i>Ararauna</i> (Linnaeus 1758)	Arara Canindé																	



<i>Ara chloropterus</i> Gray 1859	Arara - vermelha																			
<i>Diopsittaca nobilis</i> (Linnaeus 1758)	Mara canã																			
<i>Eupsittula aurea</i> (Gmelin , 1788)	Nand aia, periquito- rei																			
<i>Psittacara leucophthalmus</i> (Statius Muller, 1776)	Peri quitão																			
<i>Brotogeris chiriri</i> (Vieillot 1818)	Peri quito verde																			
<i>Forpus xanthopygus</i> (Spix 1824)	Tuim																			
<i>Myopsittacus monachus</i> (Boddaert 1783)	Peri quito baro o																			
<i>Aratinga nenday</i> (Vieillot 1823)	Prín cipe negro																			
<i>Pionus maximiliani</i>	Papa gaio marrom																			



(Kuhl 1820)																			
<i>Primolius auricollis</i> (Cassin 1853)	Mara canã de coleira																		
<i>Primolius maracana</i> (Vieillot 1816)	Mara canã-verdadeira																		
<i>Alipiopsitta xanthops</i> (Spix 1824)	Papagaio-galego																		

Source: authors. Legend: BMLH: Lake Malheiros; RIOI: Paraguay River I; BBCTP: Lake Boca Tampada; BRTVL: Lake Retiro Velho; RIOII: Paraguay River II; BTMVR: Lake Toma Vara; BSMNN: Lake Simão Nunes; RIOIII: Paraguay River III; BCTGD: Lake Canto Grande; BJRVL: Lake Jauru Velho; BBCNT: Lake Natalino; BEPC: Lake Éguas/Paca; BMORRI: Lake Morrinhos; BMORRO: Lake Morro; BBCMG: Lake Miguel; BJCRE: Lake Jacaré.

#### 4. CONCLUSION

The biggest richness were observed on the plain region, also for river and lakes, followed by meandric river and in the straight part was registered the small number of species, before it was big when compared with other regions of Mato Grosso.

The study area are very important for the bird conservation, because of its diversity of habitats for birds species and not only because of the number of registered species but also for the amount of each.

The area is important for the bird conservation, and for tourism, mainly birdwatching, due to “ninha” nursery presence, this area need more attention from the local people and government.



The number of species identified proves the importance of the place for the birds life.

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