



## **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).

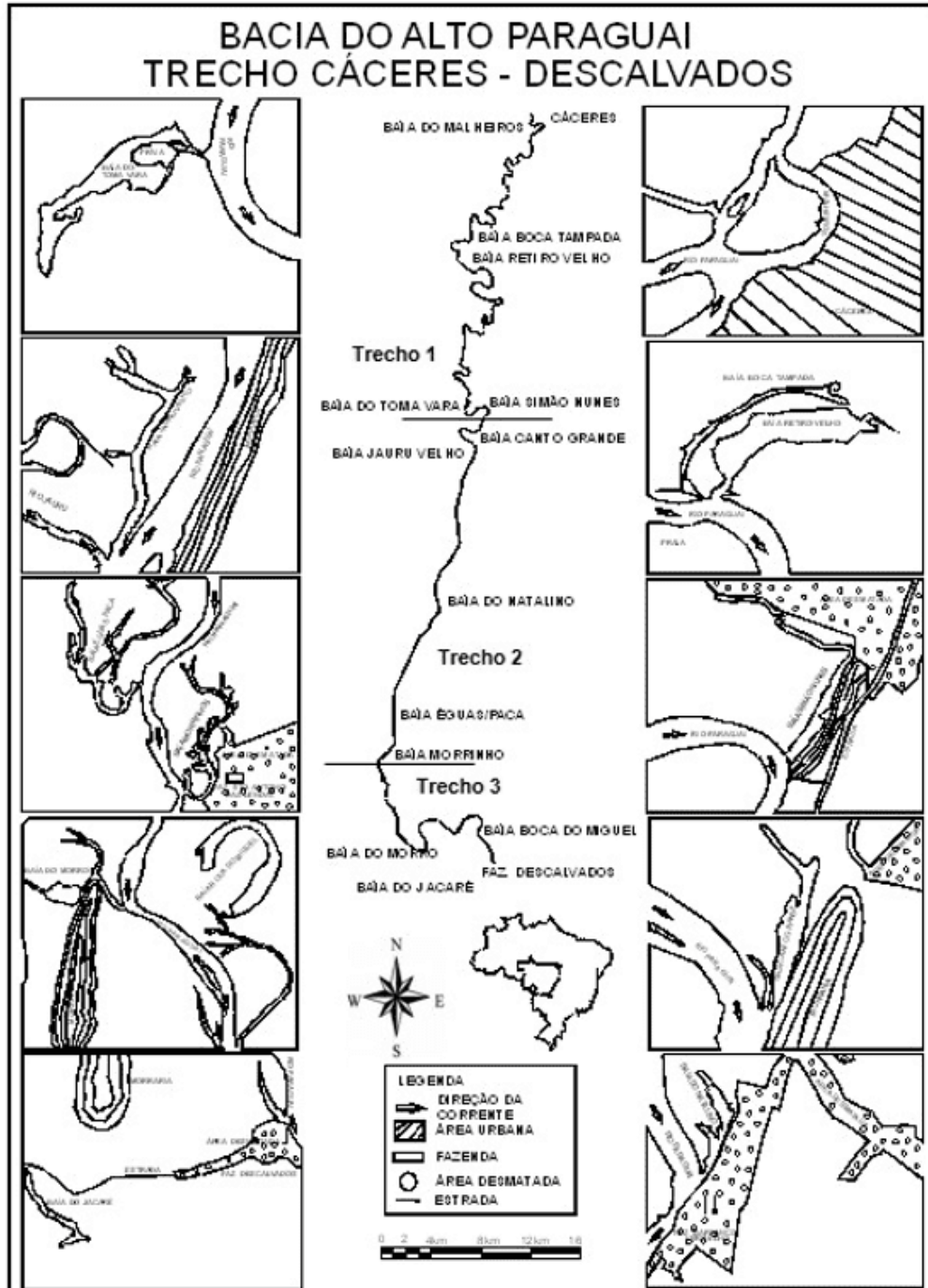
The field samples were carried out along the Paraguay River, from the urban area of the Cáceres municipality to the Descalvados farm, traversing 134km of river,



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



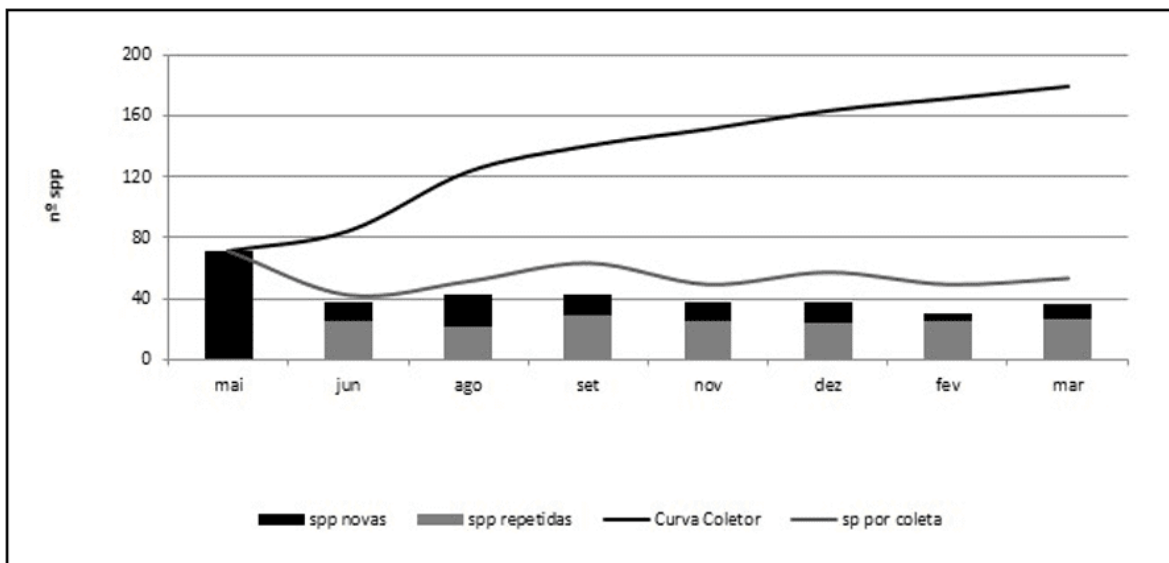
Source: authors.

### 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	Popul ar name	MLH	IOI	BCTP	RTVL	IOII	TMVR	SMNN	IOIII	CTGD	JRVL	BCNT	EPC	MORRI	MORRO	BCMG	JCRE
<b>RHEIFORMES</b>																	
<b>Forbes, 1884</b>																	
<b>Rheidae Bonaparte</b>																	
<b>1849</b>																	
<i>Rhea americana</i>	Ema																
(Linnaeus 1758)																	
<b>TINAMIFORMES</b>																	
<b>Huxley 1872</b>																	
<b>Tinamidae Gray 1840</b>																	
<i>Crypturelus parvirostris</i>	Nhama																
(Wagler 1827)	bu-xororó																
<i>Crypturelus tataupa</i>	Inham																
(Temminck 1815)	bu-chintã																
<i>Crypturelus undulatus</i>	Jaó																
(Temminck 1815)																	
<i>Rhynchotus rufescens</i>	Perdiz																
(Temminck 1815)																	
<b>ANSERIFORMES</b>																	
<b>Linnaeus 1758</b>																	
<b>Anhimidae Stejneger</b>																	
<b>1885</b>																	
<i>Anhima cornuta</i>	Tachã,																
(Linnaeus 1766)	Anhuma																
<i>Chauna torquata</i> (Oken	Inhum																
1816)	a, tachã																
<b>Anatidae Leach 1820</b>																	
<b>Anatinae Leach 1820</b>																	
<i>Amazonetta brasiliensis</i>	Sinhaz																
(Gmelin 1789)	inha																
<i>Cairina moschata</i>	Pato-																
(Linnaeus 1758)	do-mato																
<b>Dendrocygnae</b>																	
<b>Reichenbach 1850</b>																	
<i>Dendrocygna</i>	Asa-																
<i>autumnalis</i> (Linnaeus 1758)	branca																
<i>Dendrocygna bicolor</i>	Marre																
(Vieillot 1816)	ca-caneleira																
<i>Dendrocygna viduata</i>	Irerê																
(Linnaeus 1766)																	
<b>GALLIFORMES</b>																	
<b>Linnaeus 1758</b>																	
<b>Cracidae Rafinesque</b>																	
<b>1815</b>																	
<i>Crax fasciolata</i> Spix	Mutu																
1825)	m pinima																
<b>Taxa Name</b>	<b>Popul ar name</b>	<b>MLH</b>	<b>IOI</b>	<b>BCTP</b>	<b>RTVL</b>	<b>IOII</b>	<b>TMVR</b>	<b>SMNN</b>	<b>IOIII</b>	<b>CTGD</b>	<b>JRVL</b>	<b>BCNT</b>	<b>EPC</b>	<b>MORRI</b>	<b>MORRO</b>	<b>BCMG</b>	<b>JCRE</b>
<i>Ortallia canicollis</i>	Aracu																
(Wagler 1830)	ã-do-papntanal																
<i>Penelope orogaster</i>	Jacu-																
Pelzein 1870	barriga-castanha																
<i>Aburria cujubi</i> (Pelzein	Cujubi																
1858)																	
<i>Aburria cumanensis</i>	Jacutin																
(Spix 1825)	ga																
<b>PODICEPEDIFORM</b>																	
<b>ES Furbring 1888</b>																	
<b>Podicepedidae</b>																	
<b>Bonaparte 1831</b>																	
<i>Podilymbus podiceps</i>	Mergu																
(Linnaeus 1758)	lhão caçador																
<i>Tachybaptus dominicus</i>	Mergu																
(Linnaeus 1766)	lhãozinho																
<b>CICONIIFORMES</b>																	
<b>Bonaparte 1854</b>																	
<b>Ciconiidae Sundevall</b>																	
<b>1836</b>																	
<i>Ciconia maguari</i>	Tabuía																
(Gmelin 1789)	ia, maguari																
<i>Jabiru mycteria</i>	Tuiuiu																
(Lichtenstein 1819)																	
<i>Mycteria americana</i>	Cabeç																
(Linnaeus 1758)	a-seca																





Taxa Name	Popul ar name	MLH	IOI	BCTP	RTVL	IOII	TMVR	SMNN	IOIII	CTGD	JRVL	BCNT	EPC	MORRI	MORRO	BCMG	JCRE
<b>SULIFORMES Sharpe</b>																	
<b>1891</b>																	
<b>Anhingidae</b>																	
<b>Reichenbach 1849</b>																	
<i>Anhinga anhinga</i> (Linnaeus 1766)	Biguat inga, biuá																
<b>Phalacrocoracidae</b>																	
<b>Reichenbach 1849</b>																	
<i>Nannopterum brasiliense</i> (Gmelin 1789)	Biguá																
<b>PELECANIFORMES</b>																	
<b>Sharpe 1891</b>																	
<b>Ardeidae Leach 1820</b>																	
<i>Ardea alba</i> Linnaeus 1758	Garça-branca-grande																
<i>Ardea cocoi</i> Linnaeus 1766	magua ri, garça moura																
<i>Botaurus pinnatus</i> (Wagler 1829)	Socó boi baio																
<i>Bubulcus ibis</i> (Linnaeus 1758)	Garça vaqueira																
<i>Butorides striata</i> (Linnaeus 1758)	Socozi nho																
<i>Cochlearius cochlearius</i> (Linnaeus 1766)	Arapa pa																
<i>Egretta caerulea</i> (Linnaeus 1758)	garcin ha azulada																
<i>Egretta thula</i> (Molina 1782)	Garça-pequena																
<i>Ncticorax nycticorax</i> (Linnaeus 1758)	Socó dorminhoco																
<i>Ptilherodrius pileatus</i> (Boddaert 1783)	Garça real																
<i>Syrigma sibilatrix</i> (Temminck 1824)	Maria Faceira																
<i>Tigrisoma lineatum</i> (Boddaert 1783)	Socó boi																
<i>Zebrius undulatus</i> (Gmelin 1789)	Socoí-zigue-zague																
<b>Threskionitidae Poche,</b>																	
<b>1904</b>																	
<i>Mesembrinibis cayennensis</i> (Gmelin 1789)	Frango d'água																
<i>Phimosus infuscatus</i> (Lichtenstein 1823)	Tapicu ru-cara-pelada																
<i>Platalea ajaja</i> Linnaeus 1758	Colher eiro																
<i>Theristicus caudatus</i> (Boddaert 1783)	Curica ca																
<i>Theristicus coerulescens</i> (Vieillot 1817)	Curica ca cinza, real																
<b>CATHARTIFORMES</b>																	
<b>Seebohm 1890</b>																	
<b>Cathartidae</b>																	
<b>Lafresnaye 1839</b>																	
<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>Sarcoranphus papa</i> (Linnaeus 1758)	urubu-rei																
<b>ACCIPITRIFORMES</b>																	
<b>Bonaparte 1831</b>																	
<b>Pandionidae</b>																	
<b>Bonaparte 1854</b>																	
<i>Pandion haliaetus</i> (Linnaeus 1758)	Águia pescadora																
<b>Accipitridae Vigors</b>																	
<b>1824</b>																	
<i>Busarellus nigricollis</i> (Lathan 1790)	Gaviã o-belo																











Falconidae Leach 1820																			
Taxa Name	ar name	Popul		MLH	IOI	BCTP	RTV	IOII	TMV	SMN	IOIII	CTG	JRVL	BCNT	EPC	MORR	MORR	BCM	JCRE
							L	R	N		D				I	O	G		
(Miller 1777)	<i>Caracara plancus</i>	Carcar	á																
Temminck 1825	<i>Falco deiroleucus</i>	falção-peito-laranja																	
Temminck 1822	<i>Falco femoralis</i>	falção-de-coleira																	
Daudin 1800	<i>Falco rufigularis</i>	gavião-carijó, cauré																	
Linnaeus 1758	<i>Falco sparverius</i>	Quiriq																	
	<i>Herpetotheres cachimans</i> (Linnaeus 1758)	uiri	Acauã,																
(Vieillot 1817)	<i>Micrastur semitorquatus</i>	Pinhé																	
(Vieillot 1816)	<i>Milvago chimachima</i>	o relógio	Gaviã																
		o pinhé	Gaviã																
PSITTACIFORMES																			
Wagler 1830																			
Psittacidae Rafinesque																			
1815	<i>Amazona aestiva</i>	Papag																	
(Linnaeus 1758)		aio verdadeiro																	
(Linnaeus 1766)	<i>Amazona amazonica</i>	Papag																	
		aio trombeteiro																	
	<i>Anodorhynchus hyacinthinus</i> (Lat 1790)	Ararau	na																
1758)	<i>Ara ararauna</i> (Linnaeus)	Arara	Canindé																
1859	<i>Ara chloropterus</i> Gray	Arara-vermelha																	
(Linnaeus 1758)	<i>Diopsittaca nobilis</i>	Marac	anã																
(Gmelin, 1788)	<i>Eupsittula aurea</i>	Nandaia, periquito-rei																	
	<i>Psittacara leucophthalmus</i> (Statius Muller, 1776)	Periqu	itão																
(Vieillot 1818)	<i>Brotogeris chiriri</i>	Periqu	ito verde																
(Spix 1824)	<i>Forpus xanthopterygius</i>	Tuim																	
(Boddaert 1783)	<i>Myopsitta monachus</i>	Periqu	ito baroso																
(Vieillot 1823)	<i>Aratinga nenday</i>	Princi	pe negro																
(Kuhl 1820)	<i>Pionus maxilimiani</i>	Papag	aio marrom																
(Cassin 1853)	<i>Primolius auricollis</i>	Marac	anã de coleira																
(Vieillot 1816)	<i>Primolius maracana</i>	Marac	anã-verdadeira																
(Spix 1824)	<i>Alipiopsitta xanthops</i>	Papag	aio-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 streight 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 “ninhai” 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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