Potential of avifauna as a conservation tool for the Ivaí River Biodiversity Corridor

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RESUMO
Os corredores ecológicos são instrumentos de gestão ambiental e territorial que visam conectar fragmentos de áreas naturais, permitindo o fluxo de genes e o movimento da biota, contribuindo para a distribuição de espécies e colonização de áreas degradadas. No Estado do Paraná, o ecossistema predominante é a Mata Atlântica, que apresenta valor ecológico comparável à Floresta Amazônica. Apesar de abrigarem uma fauna e flora ricas em espécies, a Mata Atlântica não teve a mesma atenção dedicada à Amazônia em relação à Amazônia, e a falta de ações de conservação é suprimida em cerca de 5% de sua cobertura original, que é organizada em fragmentos esparsov e desconectados. Apesar da criação do Corredor da Biodiversidade do Rio Ivaí, ainda há resistência na manutenção de áreas preservadas, principalmente por pequenos proprietários, uma vez que seriam inúteis para o plantio. Embora ainda exista uma grande diversidade de espécies animais nessa região, tornou-se necessário apresentar uma alternativa hábil para promover e valorizar a região, seu uso sustentável e desenvolvimento econômico. Nesse contexto, e considerando a importância de promover a educação ambiental com atividades de baixo impacto, a principal preocupação deste trabalho foi a disseminação da Observação de Aves, considerada um segmento do ecoturismo, que além de atuar como alternativa ao desenvolvimento econômico e sustentável, é capaz de promover a responsabilidade social e ambiental na região.

Palavras-chave: Observação de aves, ecoturismo, educação ambiental, Floresta Atlântica, ornitologia.

ABSTRACT
Ecological corridors are instruments of environmental and territorial management that aim to connect fragments of natural areas, allowing the flow of genes and the movement of biota, contributing to the distribution of species and colonization of degraded areas. In the Paraná State the predominant ecosystem is the Atlantic Forest, which presents ecological value comparable to the Amazon Forest. Although both harbor a species-rich fauna and flora, the Atlantic Forest did not share the same attention dedicated to the Amazon in relation to the, and the lack of conservation actions is suppressed to about 5% of its original coverage, which is arranged in sparse and disconnected fragments. Despite the creation of the Rio Ivaí Biodiversity Corridor, there is still resistance in maintaining preserved
areas, mainly by small landowners, since they would be useless for planting. Whereas there is still a great diversity of animal species in this region, it became necessary present a skillful alternative to promote and value the region, their sustainable use and economic development. In this context, and considering the importance of promoting environmental education with low impact activities, the main concern of this work was the dissemination of Birdwatching, considered a segment of ecotourism, which in addition to acting as an alternative to economic and sustainable development, is capable of promoting social and environmental responsibility in the region.

**Keywords:** Birdwatching, ecotourism, environmental education, Atlantic Forest, ornithology.

**1 INTRODUCTION**

The processes of industrialization through which Brazil and the world have passed, as well as the historical-cultural context in which we live, imputed in society the thought that "forests are symbols of backwardness and underdevelopment", which resulted in the reduction of our ecosystems to the small and limited stretches distributed individually by the country (ITCF, 1987). Along with industrialization there has been growing concern about the recovery of man-made damages to these ecosystems, then from the twentieth century, reforested areas emerged in Brazil, and the search for sustainable economic exploitation has been increasingly frequent (FIGUEIREDO 2003, IPAM, 2016).

The Atlantic Forest biome is one of the most affected by forest fragmentation, has a very high ecological value, that can be compared with the homologous formation, Amazon Forest. It is a sad fact that the Atlantic Forest did not have the same attention given to the Amazon, and fragments corresponding to about 5% of their original totality are now reduced to sparse, currently being highly endangered. Moved by the concern to recover and mitigate man-made damages to the ecosystem, the Paraná State, in 2004, recognized, through Decree nº 3320, of July 12, 2004, some priority areas for the implementation of Legal Reserves: 1º Protected Areas of Integral Protection; 2º Interior of the Environmental Protection Areas (APAs) e Areas of riparian forest (5 km from the bank) of the rivers that make up the Biodiversity Corridors in the State. Among them, the Corridor of Ivaí, that will occupy considerable area in the interior of the Paraná State (IPAM, 2015, ITFC, 1987).

The Ecological Corridors are instruments of environmental and territorial management that aim to connect fragments of natural areas and allow the flow of genes between them and the movement of the biota, contributing to the distribution of species and colonization of degraded areas (MMA, 2016). They are created from ecological studies that provide information on the movement of species, areas of life, distribution of their populations or strategically linking fragments to riparian forests of important rivers of the region, as is the case of the Corridor of Ivaí (MMA, 2016). Thus, in considering the immense diversity of animal species that still inhabit such fragments, the creation of the Ivaí Corridor becomes of extreme importance for the preservation of the biome within the State,
then the need to change the way the areas are seen by the population, through the promotion and appreciation of natural areas, in addition to encouraging environmental awareness, and perhaps for sustainable use and economic development. (WESTERN, 1995; ITCF, 1987).

The Ivaí River is the second largest in extension and one of the largest in the Paraná State, covering a total of 685 Km and with an average flow of 549 m³/s. It is located in the 2nd and 3rd Planalto, crossing the interior of the State (ITFC, 1987, SEMA, 2010). Originally this area was covered by Semi-deciduous and Mixed Ombrophilous Seasonal Forest, and some points of closed fields. The Ivaí River Basin covers 105 municipalities in the interior of Paraná, an area of 36540 km² representing about 19% of the total area of the State, being still considered the second largest basin of Paraná, in it are located some UCs of special interest due to their ecological relevance, such as those located in the city of Roncador, Cândido de Abreu, Engenheiro Beltrão, Amaporã, Fênix, São João do Ivaí and Campo Mourão, (WESTERN, 1995, ITFC, 1987, SEMA, 2010, KUBOYAMA ET AL 2014).

The region's economy revolves, predominantly, around agriculture, which is the main cause of the fragmentation process in the region, where the forest gave way to pasture and monoculture. For the creation of the Corridor of Ivaí, the biggest problem found is the strip of land that the owners will have to yield to the creation of legal reserves and riparian forest. Small farmers will have their planting area reduced significantly, in this respect, an alternative of sustainable economic exploitation would be the most appropriate option for them (SEMA, 2007, IAPAR, 2009). Several strategies have been taken to promote the valorization of the region, including at the municipal level, where recently the municipalities belonging to the Ivaí River Basin have enacted laws that characterize stretches of this river as being of local interest, ie a statement that the municipality in question prioritizes the conservation of the river Ivaí. (AFFONSO, AZEVEDO & GOMES, 2016). Educating the population about the need to conserve these areas, by itself, has not shown to be effective, as it does not present a subsistence alternative to those who lost essential planting areas for their income. Given this context, ecotourism represents an important alternative to encourage the valorization of these native areas and their sustainable use; and birdwatching to be an appropriate alternative to landowners and to technical guides in the activity. In addition, it is clear that there is an important strategy for environmental education and dissemination of knowledge, because it is extremely important to provide accurate information to support adequate defense and conservation strategies, after all, it is only possible to preserve what is known, and the lack of knowledge of the richness of species that we have led to the indiscriminate suppression of forests and consequent loss of species of fauna and flora of our ecosystems (PIVATTO & SABINO, 2007, IAPAR, 2009, AFFONSO ET AL, 2016).
Birdwatching tourism became popular, for being a practice that involves leisure, research and environmental conservation, in addition to receiving a limited number of people and be possible to practice anywhere where there is the presence of birds. In addition to the benefits for professionals, it is a profitable activity, because birdwatchers pay significant sums for the opportunity to observe and record certain species (LOPES & SANTOS, 2004, FIGUEIREDO, 2013, TAPPER, 2006).

Therefore, this work presents a simple and objective alternative, very popular in ecotourism, as a potential source of income generation in the region, birdwatching tourism. And that according to LOPES & SANTOS (2004) reconciles regional valorization, sustainable tourism, profitability and environmental education. Through a brief description of the ornithological importance of the region highlights the potential for bird observation where it is predicted by Decree nº 3320, of July 12, 2004, the creation of the Ivaí Biodiversity Corridor, which includes the Ivaí River Basin.

2 METHODS

The studied area covered the cities belonging to the Ivaí River Basin (Figure 1) and the development of the work took place in two stages:

Bibliographic review:

- Survey of Cities, Conservation Units and Management Plans of the Ivaí River Basin - IAP Website.
- List of Birds registered by Bird Watchers in these cities - WikiAves Website

![Figure 1. Study area - municipalities belonging to the Ivaí River Basin](Image-URL)
Analysis of data:

At this stage the data obtained through the mentioned sites were screened, leading us to identify cities already frequented by bird watchers; list of species already registered by birdwatchers in the region, number of birdwatchers who have already recorded species on visits to the region; most visited cities, that is, with more registrations in WikiAves; little or unexplored cities by birdwatchers; based on the Wikiaves records and the management plan of the UCs, identified potential cities for tourism exploration, that is, rare species, endemic and of great interest to birdwatchers.

In order to measure the stage of bird observation in the studied municipality, we consider:
- unlisted municipalities: non-existent birdwatching;
- municipalities with a list of up to 30 species: early stage bird observation.;
- municipalities with a list of more than 30 species: established birdwatching.

3 RESULTS

Of the 105 cities belonging to the Ivaí River Basin, on 11 there is no list of species on the WikiAves website and 49 cities appear with a list of less than 30 species, which corresponds to 57.14% of municipalities with low or no birdwatching activity (Tabela 1).

| Municipalities                        | Number of species | Number of birdwatchers residing | Number of birdwatchers visitors |
|---------------------------------------|-------------------|---------------------------------|---------------------------------|
| Alto Paraná                           | 8                 | 0                               | 2                               |
| Amaporã                               | 35                | 0                               | 5                               |
| Apucarana                             | 317               | 24                              | 30                              |
| Arapuã*                               | 0                 | 0                               | 0                               |
| Araruna                               | 46                | 4                               | 4                               |
| Ariranha do Ivaí                      | 6                 | 0                               | 1                               |
| Barbosa Ferraz                        | 7                 | 1                               | 4                               |
| Boa Ventura de São Roque              | 1                 | 0                               | 1                               |
| Bom Sucesso*                          | 0                 | 0                               | 0                               |
| Borrazópolis                          | 83                | 0                               | 6                               |
| Califórnia                            | 11                | 1                               | 2                               |
| Cambira                               | 2                 | 0                               | 2                               |
| Campo Mourão                          | 302               | 18                              | 29                              |
| Cândido de Abreu                      | 171               | 2                               | 4                               |
| Cianorte                              | 220               | 8                               | 13                              |
| Cidade Gaúcha                         | 17                | 0                               | 2                               |
| Corumbatai do sul                     | 12                | 0                               | 1                               |
| Cruzeiro do Oeste                     | 100               | 1                               | 6                               |
| Cruzaltina                            | 35                | 0                               | 4                               |
| Douradina                             | 8                 | 0                               | 1                               |
| Doutor Camargo                        | 56                | 0                               | 5                               |
| Engenheiro Beltrão                     | 61                | 1                               | 6                               |
| Faxinal                               | 52                | 0                               | 17                              |
| Fênix                                 | 188               | 4                               | 14                              |
| Floral*                               | 0                 | 0                               | 0                               |
| Floresta                              | 3                 | 0                               | 2                               |
| Godoy Moreira                         | 22                | 0                               | 1                               |
| Brazil | PMS | PMS |
|--------|-----|-----|
| Grandes Rios | 12 | 0 | 1 |
| Guairaca | 3 | 1 | 1 |
| Guamiranga | 2 | 0 | 2 |
| Guaporema* | 0 | 0 | 0 |
| Guarapuava | 236 | 34 | 49 |
| Icaraima | 64 | 1 | 10 |
| Indianopolis | 17 | 0 | 2 |
| Irati | 333 | 43 | 33 |
| Iretama | 43 | 1 | 9 |
| Itambé | 2 | 1 | 2 |
| Ivaí | 18 | 0 | 3 |
| Ivaiporã | 15 | 2 | 4 |
| Ivaté* | 0 | 0 | 0 |
| Ivatuba | 12 | 1 | 3 |
| Jandaia do Sul | 11 | 1 | 5 |
| Japura | 13 | 0 | 2 |
| Jardim Alegre | 94 | 1 | 4 |
| Jussara | 4 | 2 | 4 |
| Kalore | 114 | 2 | 1 |
| Lidianopolis | 30 | 1 | 6 |
| Loanda | 6 | 1 | 2 |
| Luiziana | 55 | 0 | 3 |
| Lunardelli | 41 | 0 | 1 |
| Mambore | 7 | 0 | 1 |
| Mandaguaçu | 37 | 2 | 4 |
| Mandaguar | 21 | 1 | 8 |
| Manoel Ribas | 323 | 3 | 9 |
| Maria Helena | 6 | 0 | 3 |
| Marialva | 45 | 1 | 8 |
| Marilândia do Sul | 39 | 0 | 9 |
| Marilena | 63 | 0 | 5 |
| Maringa | 193 | 103 | 67 |
| Marumbi | 2 | 0 | 1 |
| Mato rico | 154 | 2 | 1 |
| Miauá da Serra | 104 | 1 | 27 |
| Mirador* | 0 | 0 | 0 |
| Nova Aliança do Ivaí* | 0 | 0 | 0 |
| Nova Esperança | 2 | 1 | 1 |
| Nova Olimpia | 2 | 0 | 2 |
| Nova Tebas | 15 | 0 | 4 |
| Novo Itacolomi | 5 | 0 | 3 |
| Ortingueira | 233 | 4 | 29 |
| Ourizona | 30 | 0 | 2 |
| Paiçandu | 43 | 2 | 4 |
| Paraíso do Norte | 21 | 2 | 2 |
| Paranaivai | 86 | 10 | 7 |
| Peabiru | 32 | 1 | 6 |
| Pitanga | 57 | 3 | 12 |
| Planaltina do Paraná | 31 | 0 | 3 |
| Porto Rico | 67 | 0 | 21 |
| Presidente Castelo Branco | 3 | 0 | 1 |
| Prudentópolis | 116 | 2 | 31 |
| Querência do Norte | 94 | 0 | 14 |
| Quinta do Sol | 5 | 0 | 2 |
| Reserva | 20 | 1 | 2 |
| Rio Bom | 24 | 1 | 3 |
| Rio Branco do Ivaí* | 0 | 0 | 0 |
| Roncador | 52 | 1 | 7 |
| Rondon | 10 | 0 | 2 |
| Rosário do Ivaí | 90 | 1 | 3 |
| Santa Cruz de Monte | 0 | 0 | 0 |
| Castelo* | 0 | 0 | 0 |
In the ranking of the 100 cities with the largest number of users registered in WikiAves, for example, is Maringá, with occupies a 41st position with 103 users. The Paraná State appears in 8° in the national ranking of number of species with 697 registered species and in 6° in the national ranking of users with 1845 registered birdwatchers in the website.

**4 DISCUSSION**

Some of the cities in the Ivaí River basin already explore ecotourism, which facilitates the exploration of birdwatching tourism: are they: Prudentópolis, Iretama, Campo Mourão, Faxinal e Maringá. The lack of records in some cities does not mean that there is no potential to be exploited by the activity. There are 2 federal CUs along the Ivaí River Basin, 11 state CUs and 27 municipal CUs, and 69 RPPNs, propitious locations for birdwatching. The lack of knowledge of these areas by observers prevents appreciation of the hobby, keeping the place off the route of interest due to lack of information of existing species.

The Paraná State is one of the most explored by birdwatchers in Brazil, and most of the species registered for the State can be found in the Ivaí River Basin, where they were registered in WikiAves, 505 species of 75 families. According to data from the WikiAves website, the region of the Ivaí River Basin has received more than 200 visiting birdwatchers, that is, they do not reside in the Ivaí River Basin; of the species already registered in the region, we highlight: *Sporophila frontalis* (Buffy-fronted Seedeater), *Amazona vinacea* (Vinaceous-breasted Parrot), *Biatas nigropectus* (White-bearded Antshrike), *Onychorhynchus swainsoni* (Atlantic Royal Flycatcher) and *Procnias nudicollis* (Bare-throated Bellbird); such species are on the list of globally endangered birds (IUCN, 2015). Six species are among the threatened birds in Brazil and twenty-two among those threatened in the Paraná State. Birdwatchers are very important for ecological knowledge and for disseminating the tourist
potential of the region, contributing to the survey of the local avifauna, attracting the attention of other birdwatchers and increasing the search for specialized guides.

The socioeconomic history of the region, mostly agricultural, turned forests and everything related to ecology a setback, incapable of generating economic development and of utterly insignificant importance. This fact hampers the sustainable exploitation of the region, including through the birdwatching, since the look of the region's inhabitants is not molded for the recognition of the ecological potential as well as the possibility of economic exploitation, so that a stimulus is necessary for the development of this look aimed at conservation.

The lack of knowledge about the region's avifauna wealth impedes the adequate conservation of green areas and the exploration of a promising area of ecotourism, which could promote the valorization of the region and sustainable economic development. In this way the dissemination of areas of interest for bird watching along the Ivaí Corridor, together with environmental education practices aimed at local residents, would be an interesting strategy to awaken the community not only to the need for conservation of the region, but for the practice of this hobby, in order to leverage the tourist exploitation of the same.

The data of the present work emphasize that the region has an incomparable wealth of species and that urgently needs to be preserved. The Ivaí Biodiversity Corridor provides some hope of gene stability for the populations that still exist in these fragments and Birdwatching emerges as a sustainable economic niche to be explored in the region, but mainly as an alternative to environmental education and conservation of local birdlife.

REFERENCES

Carvalho G. 2011. Início de um novo hobby: a história recente do *birwatching* no Brasil é um exemplo dos inúmeros caminhos que o conhecimento encontra para ser produzido e socializado. *Scientific American Brasil* – Duetto Editorial, out.

Decreto de Lei nº3320, de 12 de Julho de 2004.

Figueiredo LFA 2003. Observação de Aves. Centro de Estudos Ornitológicos. http://www.ceo.org.br/ (acesso em 29 de julho de 2015).

IAP 2016. Programa Paraná Biodiversidade. http://www.iap.pr.gov.br/modules/conteudo/conteudo.php?conteudo=134 (acesso em 29 de março de 2016).

IPAM 2016. Recuperação de áreas degradadas – cartilha. http://ipam.org.br/cartilhas-ipam/recuperacao-de-areas-degradadas/ (Acesso em 08 de abril de 2016).
ITCF 1987. Plano de manejo do Parque Estadual Vila Rica do Espírito Santo. Curitiba: ITCF.

IUCN 2016. The IUCN Red List of Threatened Species. Version 2015-4. http://www.iucnredlist.org (Acesso em 20 de maio de 2016).

Lopes S. da F., Santos RJ 2004. Observação de aves: do ecoturismo à educação ambiental. Caminhos da Geografia, v. 5, n. 13.

MMA 2016. Corredores Ecológicos. http://www.mma.gov.br/areas-protegidas/instrumentos-de-gestao/gestao-territorial-para-a-conservacao/corredores-ecologicos (Acesso em 29 de março de 2016).

Pivatto MAC, Sabino J., Favero S., Michels L. 2007. Perfil e viabilidade do turismo de observação de aves no Pantanal Sul e Planalto de Bodoquena (Mato Grosso do Sul) segundo interesse dos visitantes. Revista Brasileira de Ornitologia, v. 15, n. 4.

Pivatto MAC, Sabino J. 2007a. Infraestrutura receptiva para o turismo de observação de aves no Pantanal Sul e Planalto do Bodoquena, Mato Grosso do Sul. Observatório de Inovação e Turismo – Revista Acadêmica, v. 3, n. 4.

Pivatto MAC, Sabino J. 2007b. O turismo de observação de aves no Brasil: breve revisão bibliográfica e novas perspectivas. Atualidades Ornitológicas, n. 139.

Tapper R. 2006. Wildlife Watching and Tourism: a study on the benefits and risks of a fast growing tourism activity and its impacts on species. United Nations Environment Programme (UNEP) and the Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

Western D. 1995. Definindo o Ecoturismo. Em: Ecoturismo: um guia para planejamento e gestão. 1 edição. São Paulo: Senac.

Wheatley N. 1995. Where to watch birds in South American. Princeton University Press.