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## **Water diversion in Brazil threatens biodiversity: Potential problems and alternatives**

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## **Water diversion in Brazil threatens biodiversity: Potential problems and alternatives**

### **Abstract**

Construction of water diversions is a common response to the increasing demands for freshwater, often resulting in benefits to communities but with the risk of multiple environmental, economic and social impacts. Water-diversion projects can favor massive introductions and accelerate biotic homogenization. This study provides empirical evidence on the consequences of a Proposed Law intended to divert water from two large and historically isolated river basins in Brazil: Tocantins to São Francisco. Compositional similarity (CS) and  $\beta$ -diversity were quantified encompassing aquatic organisms: mollusks, zooplankton, crustaceans, insects, fishes, amphibians, reptiles, mammals and plants. For CS we *i*) considered only native species, and *ii*) simulated the introduction of non-natives and assumed the extinction of threatened species due to this water-diversion project. We highlight the environmental risks of such large-scale projects, which are expected to cause impacts on biodiversity linked to bioinvasion and homogenization, and we recommend alternatives in order to solve water-demand conflicts.

### **Keywords**

Animal conservation; Biological conservation; Biological invasions; Biotic interchange; Environmental impacts; Inter-basin water transfer

## **INTRODUCTION**

Human demand for water for domestic consumption, agriculture, and navigation development has historically led nations to propose actions that can prove unsustainable over long periods (Bagla 2014; Brito and Magalhães 2017). Construction of water-diversion schemes is a common response to the increasing demand for freshwater (Liu et al. 2015; Zhang et al. 2015). This ancient human practice connects one river basin to another through artificial canals, often resulting in positive benefits to communities, but with generally ignored risks to the environmental, economic and social spheres in both the short and the long term (Moreira-Filho and Buckup 2005; Zhang et al. 2018). Water diversions can cause significant hydrological deficits and major changes in the dynamics of the river flow in the donor basin, in addition to habitat destruction, collapse of fisheries, spread of parasites, transmission of diseases, loss of genetic variability between populations, biological invasions, species extinction, and water pollution (Liang et al. 2012; Vitule et al. 2015; Merciai et al. 2017; Qin et al. 2018). Here, together with habitat alteration caused by water-diversion projects, another major ecological effect was highlighted, the concomitant indiscriminate and unplanned biotic interchange between basins. Artificial canals allow the dispersal of isolated taxa or populations between historically separated basins, resulting in multiple introductions of different organisms that otherwise would only very rarely overcome geological barriers (Zhan et al. 2015; Gallardo and Aldridge 2018).

38 Major water-diversion projects have been implemented around the world, such as China's South-to-North diversion and South Africa's Orange-Fish-Sundays project (Woodford et al. 2013; Zhan et al. 2015). In addition to water diversions that are already in operation, there are plans to connect countless other river basins worldwide. For

example, in North America around 30 water-diversion projects are planned (Shumilova et al. 2018).

Similarly, water-diversion projects in Brazil have been developed in various regions of the country without appropriate consideration of environmental issues, the importance of which are not recognized owing to a lack of political motivation (Andrade et al. 2011; Vitule et al. 2015). Negative impacts resulting from the interchange of water between river basins are already apparent, with the introduction of non-native species (notably fishes) one of the most evident impacts (e.g. Moreira-Filho and Buckup 2005; Ramos et al. 2018). More astonishingly, novel large-scale projects are still being undertaken (Andrade et al. 2011; Shumilova et al. 2018), disregarding mechanisms for preventing biological invasions and ignoring policies that could preserve biodiversity and riverine ecosystem services for future generations.

An old and controversial project is currently being advanced in Brazil with the aim of connecting the Tocantins and São Francisco River basins. The purpose of this large-scale project is to allow navigation between the basins and to increase the water supply in Brazil's semi-arid Northeast region. The Tocantins-São Francisco water-diversion project (hereafter TO-SF-WDP) has been opposed by local people in the donor basin and has been questioned by a number of politicians, even including those who are not usually sympathetic about environmental protection measures (Online Reference 1 – Supplementary Material). Here we provide empirical evidence showing that the TO-SF-WDP would constitute a serious setback for environmental policies in Brazil. It would jeopardize aquatic ecosystems in the Amazon and Tocantins River basins, as well as cause additional damage to the São Francisco River (Brazil's third largest river basin), which is one of the most threatened rivers in South America, mostly due to the diversion of its waters that is already underway (Moreira-Filho and Buckup 2005; Brito and Magalhães 2017).

### **PROPOSED LAW (PL) 6569/2013**

The proposed law (PL) 6569/2013 is intended to divert water from the Tocantins River (Amazon River basin) to the Preto River (São Francisco River basin) (Fig. 1). The TO-SF-WDP would create a waterway for navigation between the basins and deliver water to the already-diverted São Francisco River (Online Reference 2 – Supplementary Material). The project includes plans for constructing ~200 km of canals in a network totaling 733 km that would cross several "conservation units" (protected areas), mostly in the states of Tocantins and Bahia. The proposed law was initiated under previous presidential administrations; it was approved in November 2017 by the Chamber of Deputies and was tabled in June 2018 by the Senate (Online Reference 3 – Supplementary Material). The archiving was mainly motivated by the absence of studies and technical support justifying the supposition that the TO-SF-WDP would preserve the donor basin. However, the archiving does not guarantee that this PL will be forgotten or that new water-diversion projects will not be proposed, given that politicians are ignoring this decision and promising that the transposition project will be carried out (e.g. Online References 4 and 5 – Supplementary Material).

### **PUTTING BIODIVERSITY AT RISK**

The main impact expected from the proposed TO-SF-WDP is the introduction of non-native organisms from one basin to another and the many potential negative effects that the introduced species can have on the receiving basin's biota and ecosystem services. Organisms may be carried passively by river flow from the Tocantins to the São Francisco basin (aquatic invertebrates, eggs and juvenile of fish, aquatic plants, and algae), or they may disperse actively in both directions (crustaceans, fishes and reptiles). Displacement of aquatic plants (floating mats or plant fragments) through the network may also play a fundamental role dispersing many organisms that colonize these plants (Marsden and Ladago 2017).

Additionally, because part of the rationale for the TO-SF-WDP is to ensure navigation between the basins, encrusted aquatic organisms may be carried by boats and barges, as is commonly reported in other cases of biological invasion (Table S1). The Amazon River basin has a long history of international navigation, and ballast water may enhance introductions, as occurred with the invasive Asian clam *Corbicula fluminea* (Müller, 1774) (Table S1), and an Asian midge (Chironomidae) species (Amora et al. 2015).

Globally, introduction of non-native species is considered to be one of the primary causes of species extinction (Clavero and Garcia-Berthou 2005; Sax and Gaines 2008; Bellard et al. 2016), as well as ecosystem disruption (Lövei et al. 2012). Species introductions represent an important phenomenon that needs to be studied and prevented, in particular because of the large catalogue of negative impacts (Simberloff and Vitule 2014). Biological invasions are of paramount concern for conservationists and a huge challenge in megadiverse countries, where introductions of non-native species and environmental degradation of rivers are accelerating the biotic homogenization process (e.g. Lövei et al. 2012; Winemiller et al. 2016). The outcome of biotic homogenization is a consistent decrease over time in the genetic, taxonomic, or functional distinctiveness of biotas, which occurs across a variety of ecosystems and taxonomic groups (Olden et al. 2004). Connecting distinct drainage basins through large-scale projects greatly facilitates biotic homogenization, as is the case of the planned Nicaragua Canal, which would certainly cause a biotic upheaval in the freshwater fish fauna of the affected basins, whose current compositional similarity is only one-third (Härer et al. 2017).

The Tocantins River is a tributary of the Amazon River basin and hosts valuable biodiversity, corresponding to an important area of endemism, particularly for fish: around 400 species are present, of which 50% are endemic to the basin – the highest percentage among all Amazonian tributaries (Winemiller et al. 2016). As a consequence, the Tocantins River shares only a few species with the São Francisco River (see Methods section and Table S2 – Supplementary Material), with a low compositional similarity (CS) for native assemblages of mollusks, zooplankton, crustaceans, aquatic insects, freshwater fishes, amphibians, reptiles, aquatic mammals and aquatic plants (Fig. 2 – values in black).

Furthermore, the likely introduction of non-native species and extinction of all currently threatened species owing to the construction of the TO-SF-WDP (Fig. 2 – values in red), will cause the CS for all taxonomic groups between these basins to increase even more. This scenario will be significantly more catastrophic for aquatic mammals (Fig. 2h), since all species recorded are threatened with extinction. In addition, the  $\beta$ -

diversities (Sørensen dissimilarity index -  $\beta_{sor}$ ) of mollusks ( $\beta_{sor} = 0.86$ ), zooplankton ( $\beta_{sor} = 0.71$ ), crustaceans ( $\beta_{sor} = 0.65$ ), aquatic insects ( $\beta_{sor} = 0.92$ ), freshwater fishes ( $\beta_{sor} = 0.99$ ), amphibians ( $\beta_{sor} = 0.94$ ), reptiles ( $\beta_{sor} = 0.60$ ), and aquatic plants ( $\beta_{sor} = 0.79$ ) show strong species turnover between basins (see details on Methods – Supporting Information). These results indicate that taxonomic homogenization is an anticipated outcome, leading to the loss of a long history of evolution across each taxonomic group by vicariance.

The Tocantins River currently has few non-native aquatic species, in contrast to the São Francisco River, which has a long history of non-native species introductions and invasions (Table S2 – Supplementary Material) because of intense environmental degradation driven by anthropogenic activities. Additionally, the Tocantins and São Francisco Rivers run through different biomes, physiographic regions, and climate zones (Tocantins: *Cerrado* and rainforest; São Francisco: *Cerrado* and *Caatinga* semi-arid vegetation). Thus, it is not possible to envisage which basin or ecoregion will be more affected by the biological invasions and their negative impacts or socioeconomic consequences for human populations. Information about some freshwater groups (e.g. aquatic insects and aquatic plants) is still scarce and difficult to assess, which makes the TO-SF-WDP even riskier.

Although the Tocantins River still has many endemic species, both river basins are extensively impacted by multiple disturbances, especially changes in land cover and river hydrology (e.g. construction of many dams), along with habitat conversion and degradation (Winemiller et al. 2016; Pelicice et al. 2017). Social conflicts are expected as a result of the water diversion, given that hydropower and agribusiness activities have developed significantly in the Tocantins River basin while water availability is limited (i.e. highly seasonal, with six dry months). Furthermore, lack of effective wildlife-management strategies, lead to illegal hunting (Kemenes and Pezzuti 2007). This is the case of trade traffic of *Podocnemis* spp. turtles (Pantoja-Lima et al. 2014), which is expected to expand in the TO-SF-WDP network because these species are highly appreciated for human consumption in Amazonia and other regions of the country. The sum of these factors indicates that the TO-SF-WDP would cause profound changes in both basins, including irreversible impacts affecting biodiversity patterns, ecosystem functioning, and the provision of ecosystem services that are important for conservation of aquatic resources, water supply, food production, and public health (Moreira-Filho and Backup 2005; Vitule et al. 2015; Brito and Magalhães 2017).

In summary, projects such as the TO-SF-WDP represent a huge challenge at a time when biodiversity in megadiverse nations is increasingly threatened and in need to strong conservation measures (Scarano et al. 2012; Frehse et al. 2016; Pelicice et al. 2017; Alves et al. 2018; Bockmann et al. 2018; Azevedo-Santos et al. 2019). This is a good example of sharing the multiple and complex costs associated with misguided policies and large-scale degradation (i.e. the São Francisco River) with a distinct and moderately disturbed neighbor (i.e. the Tocantins River), leading to negative consequences for both.

## BETTER POTENTIAL ALTERNATIVES

In view of the high environmental risk associated with water diversions (Zhang et al. 2018) and the lack of adequate information to guide conservation strategies and

monitoring programs, authorities should consider other alternatives. The most important recommendation is avoiding the construction of new water-diversion projects whenever possible, however if it is unavoidable, at least the construction of barriers to movement (e.g. acoustic, electrical or physical) should be also proposed, aiming to contain the spread of aquatic organisms between basins (Clarkson 2004; Rahel 2013; Rahel and Smith 2018). In the case of the TO-SF-WDP, transport functions can be served by improvement of rail connections, and, if the demand is sufficient (Matera 2012), improved air transport infrastructure can also be justified. Railways offer a still impacting alternative, but likely less than water-diversion projects. This can either be done through improvement of existing railways (e.g. EF-151, Online Reference 6 – Supplementary Material) or through the construction of new lines (*sensu* Laurance and Balmford 2013), providing transportation for both passengers and freight. As with all projects, railway construction or improvement should be preceded by multidisciplinary assessments that include explicit and honest consideration of negative impacts on biodiversity.

Water scarcity in Northeast Brazil is an important rationale for the TO-SF-WDP, as is frequently the case for water diversions worldwide. One alternative rather than water diversion projects is water reuse (Hespanhol 2002), a practice already adopted in many countries (Miller 2006). For this practice, there are methods available for treating reused water for human consumption (Warsinger et al. 2018). In addition, innovative methods have been implanted in some semi-arid regions of the world, such as water harvesting from thin air, which has low cost and maintenance (Davtalab et al. 2013; Online Reference 7 – Supplementary Material). Another alternative is rainwater harvesting, where water is captured (often from rooftops) and stored in cisterns (e.g. Gomes and Heller 2016). Rainwater harvesting systems are already in use in Brazil's Northeast region; however, they could be further implemented in the area that would receive water from the diversion project if the federal or state governments were to provide subsidies for massive application of this method. The combination of rainwater harvesting and water reuse could supply much of the demand for water for domestic use in the area served by the proposed water-diversion project.

## FINAL REMARKS

Decisions on inter-basin water diversion are being made without sufficient reference to expected environmental and social impacts related to biodiversity and biological invasions. Warnings from the scientific community are being circumvented to allow implementation of questionable economic-development projects (Vitule et al. 2015; Brito and Magalhães 2017). PL 6569/2013 is not an isolated case in Brazil (Table 1). Several large-scale projects have been developed or planned in the last decade, as is the case of the São Francisco River water diversion mentioned previously: a problematic project characterized by environmental problems and delays (Brito and Magalhães 2017). Severe water scarcity in the city of São Paulo has also led local authorities to propose diversions (Vitule et al. 2015) to bring water from several other basins (Paraíba do Sul, Ribeira de Iguape, and Itapanhaú), and recently even the transposition of the Amazon River has been suggested by politicians (Online Reference 9 – Supplementary Material). Water diversions are well accepted by Brazilian authorities because they are striking and have popular appeal. Consequently, new water diversions will appear as water demands increase.

It is also important to remember that Brazil is signatory to the Convention on Biological Diversity in which Aichi Biodiversity Target No. 9 specifies that “By 2020, *invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment*” (Online Reference 10 – Supplementary Material). We recommend that Brazil’s leaders heed warnings from the local and international scientific communities questioning PL 6569/2013 and other harmful projects with high environmental risks and costs. Authorities must always treat such projects with complete transparency, discussing both positive and negative impacts with all sectors of society, including academia. Decision makers must recognize the value of biodiversity and give more credit to science based knowledge (Azevedo-Santos et al. 2017) before formulating policy largely based on populism and particular interests. Construction of water diversions is an environmentally and economically risky activity, as our research has shown. The entire region’s natural and cultural heritage may be decimated, and freshwater ecosystems that humans and other aquatic organisms alike rely on can be compromised, certainly resulting in a global impact for humanity.

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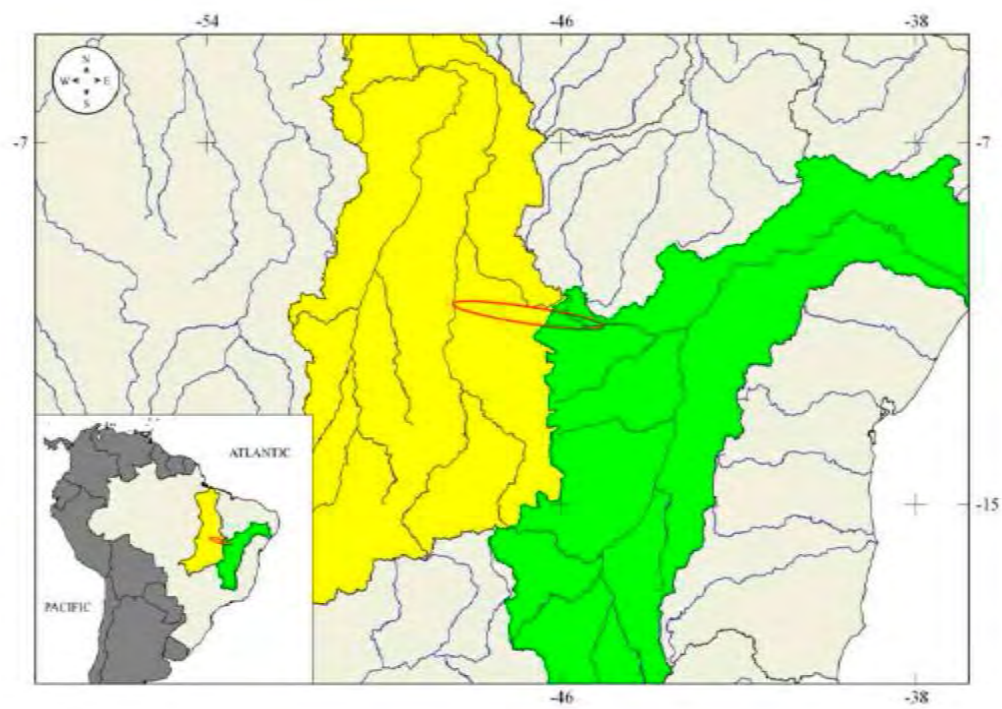
## FIGURE CAPTIONS

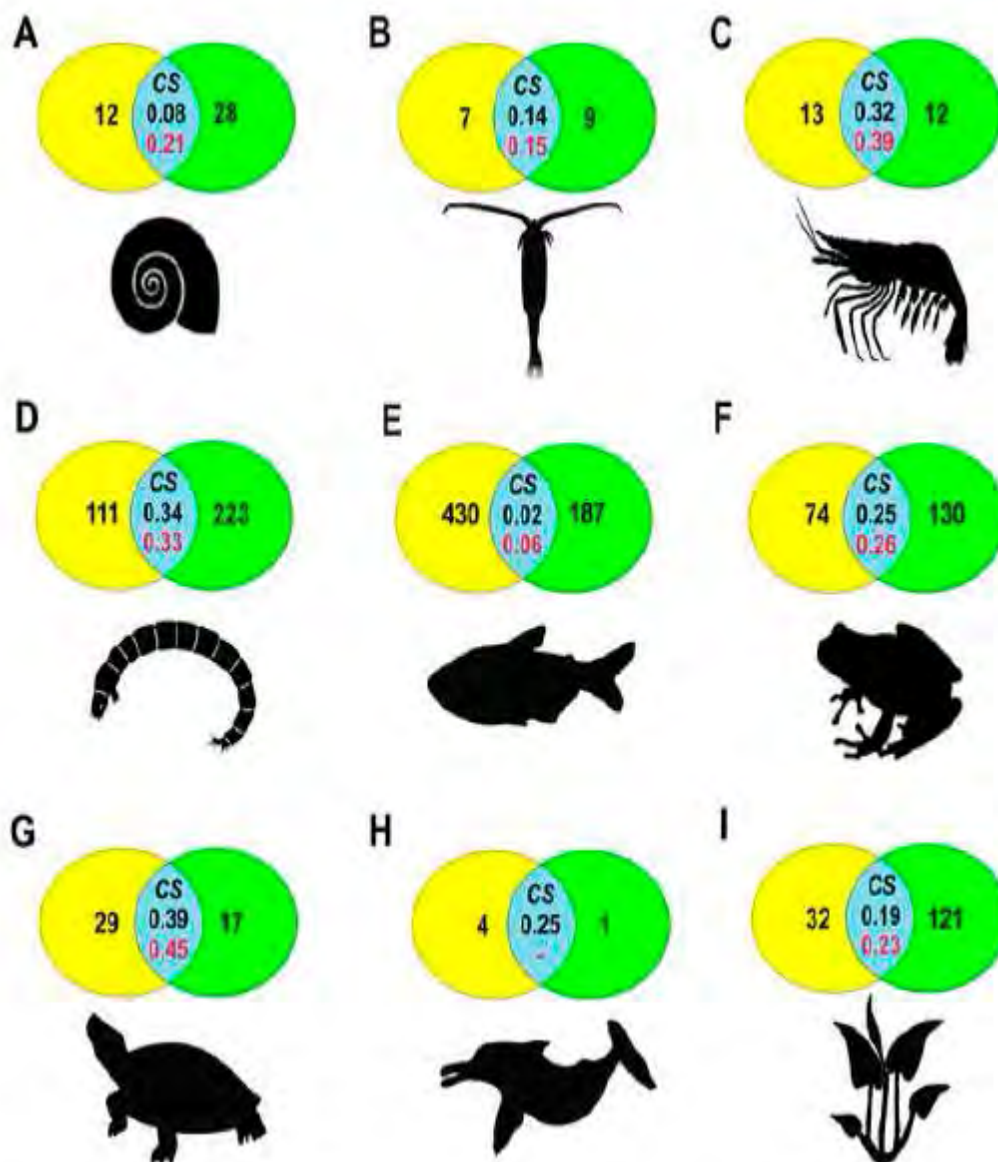
**Fig. 1** Tocantins River basin (yellow) and São Francisco River basin (green), which are planned to be connected by a water-diversion project.

**Fig. 2** Number of native species recorded in the Tocantins River basin (yellow circle) and São Francisco River basin (green circle), and the compositional similarity (CS - blue intersection): *i*) considering only native assemblages (values in black), and *ii*) taking into account the introduction of non-native species and assumes that all currently threatened species will become extinct due to the construction of the TO-SF-WDP (values in red), for each taxonomic group: **A** Mollusks, **B** Zooplankton, **C** Crustaceans, **D** Aquatic insects (genus level), **E** Freshwater fishes, **F** Amphibians, **G** Reptiles, **H** Aquatic mammals, **I** Aquatic plants (genus level). Data sources and methods are given in the Supplementary Material.

**Table 1** Examples of water diversion in Brazil. Situation: *C* concluded, *P* planned (under evaluation), *U* unknown

| Water diversions                                                                                 | Reason                   | Situation | References                                        |
|--------------------------------------------------------------------------------------------------|--------------------------|-----------|---------------------------------------------------|
| Piumhi River (Grande River basin) to Sujo River (São Francisco basin)                            | Dam                      | <i>C</i>  | Moreira-Filho and Buckup 2005                     |
| Paraíba do Sul River (Paraíba do Sul basin) to Guandu River (Guandu River basin)                 | Water supply             | <i>C</i>  | Castro and Ferreirinha 2012; Acselrad et al. 2015 |
| Itapanhaú River (Itapanhaú River basin) to Biritiba reservoir (Tietê River basin)                | Water supply             | <i>P</i>  | LabSid 2015                                       |
| Capivari stream (Capivari basin) to Piancó stream (Piacó basin)                                  | Water supply             | <i>C</i>  | Morgantini 2017                                   |
| Claro River (Claro River basin) to Saudade stream (Uberaba River basin)                          | Water supply             | <i>C</i>  | Santos and Naves 2016                             |
| Capivari River (Capivari River basin) to Cachoeira River (Cachoeira River basin)                 | Dam                      | <i>C</i>  | Branco 2008                                       |
| São Francisco River (São Francisco River basin) to Paraíba do Norte River (Paraíba River basin)  | Water supply             | <i>C</i>  | Ramos et al. 2018                                 |
| São Francisco River (São Francisco River basin) to Piranhas-Açu River (Piranhas-Açu River basin) | Water supply             | <i>C</i>  | Andrade et al. 2011                               |
| São Francisco River (São Francisco River basin) to Apodi River (Apodi River basin)               | Water supply             | <i>C</i>  | Andrade et al. 2011                               |
| São Francisco River (São Francisco River basin) to Jaguaribe River (Jaguaribe River basin)       | Water supply             | <i>C</i>  | Andrade et al. 2011                               |
| Doce River (Doce River basin) to Riacho River (Riacho River basin)                               | Water supply             | <i>C</i>  | Coelho 2006                                       |
| Paraíba do Sul to Cantareira                                                                     | Water supply             | <i>U</i>  | Andrade et al. 2011; Vitule et al. 2015           |
| Tocantins to São Francisco                                                                       | Navigation, Water supply | <i>P</i>  | this study                                        |
| Piracicaba River (Piracicaba River basin) to upper Tietê River (upper Tietê River basin)         | Water supply             | <i>C</i>  | Andrade et al. 2011                               |
| Cravo River (Cravo river basin) to Ligeirinho reservoir (Ligeirinho River basin)                 | Water supply             | <i>U</i>  | Bernardi 2014                                     |
| Caí River (Caí river basin) to Sinos River (Sinos River basin)                                   | Water supply             | <i>C</i>  | Online Reference 8 – Supplementary Material       |





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31 **Table S1** Examples of species introduced via boats and vessels in aquatic environments around the world.

| Group       | Species                                           | Native region                 | Introduced region                                                                | References |
|-------------|---------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------|------------|
| Zooplankton | <i>Kellicottia bostoniensis</i> (Rousselet, 1908) | North America                 | Iguaçu and Paraná rivers basins (Brazil)                                         | 1/2/3      |
| Zooplankton | <i>Skistodiaptomus pallidus</i> (Herrick, 1879)   | North America                 | New Zealand and Germany                                                          | 4          |
| Mollusks    | <i>Dreissena polymorpha</i> (Pallas, 1771)        | Black, Caspian, and Azov Seas | Lake St. Clair, Big St. Germain Lake, Lake Gogebic (USA), Europe and New Zealand | 5/6        |
| Mollusks    | <i>Limnoperna fortunei</i> (Dunker, 1857)         | Asia                          | São Francisco, Paraná and Uruguay rivers basins (Brazil)                         | 7/8/9      |
| Mollusks    | <i>Corbicula fluminea</i> (Müller, 1774)          | Asia                          | Brazil - spread all over the rivers basins                                       | 9/10       |
| Mollusks    | <i>Corbicula largillierti</i> (Philippi, 1844)    | Asia                          | Atlantic, Paraná and Uruguay rivers basins (Brazil)                              | 9          |
| Mollusks    | <i>Corbicula fluminalis</i> (Müller, 1774)        | Asia                          | Uruguay river Basin (Brazil)                                                     | 9          |
| Annelids    | <i>Hypania invalida</i> (Grube, 1960)             | Ponto-Caspian region          | Elbe River (Czech Republic)                                                      | 11         |
| Crustacea   | <i>Palaemon macrodactylus</i> Rathbun 1902        | Asia                          | La Plata Basin (Argentina)                                                       | 12/13      |
| Fish        | <i>Butis koilomatodon</i> (Bleeker, 1849)         | Indo-Pacific                  | Panama Canal                                                                     | 14         |

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## **METHODS**

### **Data compilation and analyses**

The datasets from the Tocantins and São Francisco Rivers basins (FEOW, 2015; Figure 1), were constructed based on multiple sources. The map in the Figure 1 was constructed using shapfiles provided by the National Water Agency (ANA, 2018) and the Ministry of Environment (MMA, 2018), through the QGIS program (Sherman et al., 2012).

The multiassemblage dataset encompassed mollusks, zooplankton, crustaceans, aquatic insects, freshwater fishes, amphibians, reptiles, aquatic mammals and aquatic plants. Data on mollusks were compiled from museum data collections and supplemented with available literature. The data on zooplankton, crustaceans, aquatic insects, amphibians, aquatic mammals and aquatic plants were obtained from available literature. The data on freshwater fish and reptiles were compiled from databases (Eschmeyer et al., 2018; Froese & Pauly, 2018; Uetz et al., 2018), and supplemented with available literature.

Based on species records for the Tocantins and São Francisco Rivers basins, the species list was constructed to indicate the most probable and parsimonious representation of the assemblages for each river basin. Native species corresponded to indigenous species occurring in each river basin as a result of natural processes, while non-native species were considered as those introduced as result of the species translocations (extra-limit introductions from other freshwater ecoregions within the Neotropical region) or introduced from other zoogeographic regions. Threatened species were considered as the most likely candidates to become extinct in the future, and are those listed as Critically Endangered (CR), Endangered (EN), Near Threatened (NT), and Vulnerable (VU), according to the IUCN Red List of Threatened Species (IUCN Red List, 2017). In addition, the list of threatened species was supplemented for aquatic insects (MMA, 2014a; ICMBio, 2016, 2018), freshwater fishes (MMA, 2014a; ICMBio, 2016, 2018), amphibians (MMA, 2014b; ICMBio, 2018), reptiles

(Testudines) (MMA, 2014b; ICNS/SSC, 2018), and aquatic mammals (MMA, 2014b; ICMBio, 2018), by including information from specific lists. This approach was considered to be the most conservative, since the data contained in the IUCN Red List of Threatened Species are incomplete for the Neotropical region (Vitule et al., 2017).

Species presence/absence data were considered to quantify the compositional similarity between river basins. Matrices were created separately for each taxonomic group, considering: *i*) only native species, and *ii*) introduction of non-native species and extinction of threatened species. Zooplankton and aquatic insects faunas did not have non-native species, while aquatic mammals comprehended only threatened species. For aquatic insects and aquatic plants the analyses were carried out at the genus level. Similarity matrices were calculated separately for *i* and *ii*, using Jaccard's coefficient of similarity. This analysis was performed in R software (R Core Team, 2016), using the 'vegan' package (Oksanen et al., 2013). Jaccard similarity matrices were created by calculating one minus the dissimilarity matrix provided in "vegdist" function. Partitioning of taxonomic dissimilarities was used to quantify variations in  $\beta$ -diversity for each taxonomic group between the two river basins (Baselga & Orme, 2012). For this analysis we used the functions 'beta.multi' and 'beta.pair' in the 'betapart' package (Baselga et al., 2018) in R software (R Core Team, 2016), based on the Sørensen dissimilarity matrix.

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**Table S2** List of species/genera for the Tocantins (TO) and São Francisco (SF) Rivers basins. Status: N (native species for each respective river basin), and I (non-native species translocated or from other zoogeographic region). Threatened species were marked with an asterisk.

| GROUP           | SPECIES/GENERA                                    | RIVER BASIN |    | REFERENCES |
|-----------------|---------------------------------------------------|-------------|----|------------|
|                 |                                                   | TO          | SF |            |
| <b>Mollusks</b> | <b>BIVALVIA</b>                                   |             |    |            |
|                 | <i>Anodontites moricandii</i> (Lea, 1860)         |             | N  | 1/2/3      |
|                 | <i>Anodontites obtusus</i> (Spix, 1927)           |             | N  | 1/4        |
|                 | <i>Anodontites tenebricosus</i> (Lea, 1834)       |             | N  | 4/5/6      |
|                 | <i>Anodontites trapesialis</i> (Lamarck, 1819)    |             | N  | 1/2/3/4    |
|                 | <i>Anodontites trapezeus</i> (Spix, 1827)         |             | N  | 2/3/4/7    |
|                 | <i>Castalia ambigua</i> Lamarck, 1819             | N           | N  | 1/5/8      |
|                 | <i>Corbicula fluminea</i> (Müller, 1774)          | I           | I  | 9/10/11    |
|                 | <i>Corbicula largillierti</i> (Philippi, 1844)    | I           | I  | 11/12/13   |
|                 | <i>Diplodon ellipticus</i> (Wagner, 1827)         |             | N  | 1/3        |
|                 | <i>Diplodon rhombeus</i> (Spix & Wagner, 1827)    |             | N  | 1/4        |
|                 | <i>Diplodon rhuacoicus</i> (d'Orbigny, 1835)      |             | N  | 14         |
|                 | <i>Diplodon rotundus</i> (Spix & Wagner, 1827)    |             | N  | 3/4/5/7/15 |
|                 | <i>Diplodon suavidicus</i> (Lea, 1856)            |             | N  | 1          |
|                 | <i>Eupera bahiensis</i> (Spix & Wagner, 1827)     |             | N  | 1          |
|                 | <i>Leila bleinvilleana</i> (Lea, 1835)            | N           |    | 3/5        |
|                 | <i>Limnoperla fortunei</i> (Dunker, 1857)         |             | I  | 16/17      |
|                 | <i>Monocondylaea franciscana</i> (Moricand, 1837) |             | N  | 3/4/5/18   |
|                 | <i>Monocondylaea paraguayana</i> d'Orbigny, 1835  |             | N  | 1          |
|                 | <i>Mycetopoda siliquosa</i> (Spix, 1827)          |             | N  | 1/2        |
|                 | <i>Mytilopsis lopesi</i> Alvarenga & Ricci, 1989  | N           |    | 1          |
|                 | <i>Pisidium pulchellum</i> (d'Orbigny, 1835)      |             | N  | 1          |
|                 | <i>Prisodon obliquus</i> Schumacher, 1817         | N           |    | 4          |
|                 | <i>Prisodon syrmatophorus</i> (Gmelin, 1791)      |             | N  | 19         |

|                    |                                                                 |   |   |          |
|--------------------|-----------------------------------------------------------------|---|---|----------|
|                    | <i>Triplodon corrugatus</i> (Lamarck, 1819)                     | N | N | 2/3/5/20 |
|                    | <b>GASTROPODA</b>                                               |   |   |          |
|                    | <i>Asolene spixii</i> (d'Orbigny, 1838)                         |   | N | 2        |
|                    | <i>Aylacostoma bicincta</i> (Reeve, 1860)                       |   | N | 2        |
|                    | <i>Aylacostoma brasiliensis</i> (Moricand, 1939)                | N | N | 1        |
|                    | <i>Aylacostoma edwardsi</i> (Lea, 1852)                         | N |   | 1        |
|                    | <i>Aylacostoma tenuilabris</i> (Reeve, 1860)                    |   | N | 1        |
|                    | <i>Aylacostoma tuberculata</i> (Wagner, 1827)                   |   | N | 1/2      |
|                    | <i>Biomphalaria glabrata</i> (Say, 1818)                        |   | N | 21       |
|                    | <i>Biomphalaria kuhniana</i> (Clessin, 1883)                    | N |   | 1        |
|                    | <i>Biomphalaria straminea</i> (Dunker, 1848)                    |   | N | 21       |
|                    | <i>Biomphalaria tenagophila</i> (d'Orbigny, 1835)               |   | N | 21       |
|                    | <i>Doryssa annulata</i> (Haltenorth & Jaeckel, 1941)            | N |   | 1        |
|                    | <i>Doryssa millepunctata</i> (Tryon, 1865)                      | N |   | 1        |
|                    | <i>Idiopyrgus rudolphi</i> (Haas, 1938)                         |   | N | 1        |
|                    | <i>Melanoides tuberculata</i> (O.F. Müller, 1774)               | I | I | 2/22     |
|                    | <i>Physella acuta</i> (Draparnaud, 1805)                        | I |   | 11       |
|                    | <i>Planorbella duryi</i> (Wetherby, 1879)                       | I |   | 11       |
|                    | <i>Pomacea maculata</i> Perry, 1810                             | N |   | 23       |
|                    | <i>Pomacea meta</i> Ihering, 1915                               |   | N | 1        |
|                    | <i>Pomacea nobilis</i> Reeve, 1856                              | N |   | 1        |
| <b>Zooplankton</b> | <b>COPEPODA: CALANOIDA: DIAPTOMIDAE</b>                         |   |   |          |
|                    | <i>Argyrodiaptomus azevedoi</i> (Wright, 1935)                  |   | N | 1        |
|                    | <i>Argyrodiaptomus neglectus</i> (Wright, 1938)                 |   | N | 1        |
|                    | <i>Argyrodiaptomus paggii</i> Previattelli & Santos-Silva, 2007 | N |   | 1        |
|                    | <i>Dasydiaptomus coronatus</i> (Sars, 1901)                     | N | N | 1        |
|                    | <i>Notodiaptomus cearensis</i> (Wright, 1936)                   |   | N | 1        |
|                    | <i>Notodiaptomus deitersi</i> (Poppe, 1891)                     | N |   | 1        |
|                    | <i>Notodiaptomus henseni</i> (Dahl, 1894)                       | N |   | 1        |

|                                                          |   |   |   |
|----------------------------------------------------------|---|---|---|
| <i>Notodiaptomus iheringi</i> (Wright, 1935)             |   | N | 1 |
| <i>Notodiaptomus isabelae</i> (Wright, 1936)             |   | N | 1 |
| <i>Notodiaptomus jatobensis</i> (Wright, 1936)           |   | N | 1 |
| <i>Notodiaptomus maracaibensis</i> Kiefer, 1954 *        | N |   | 1 |
| <i>Notodiaptomus paraensis</i> Dussart & Robertson, 1984 | N |   | 1 |
| <i>Notodiaptomus spinuliferus</i> Dussart, 1986          | N | N | 1 |
| <i>Scolodiaptomus corderoi</i> (Wright, 1936)            |   | N | 1 |

## Crustaceans DECAPODA

### Infraorder Brachyura

|                                                       |   |   |          |
|-------------------------------------------------------|---|---|----------|
| <i>Goyazana castelnaui</i> (H. Milne Edwards, 1853)   | N | N | 1/2/3/15 |
| <i>Kingsleya gustavoi</i> Magalhães, 2004             | N |   | 4/15     |
| <i>Sylviocarcinus devillei</i> H. Milne-Edwards, 1853 | N |   | 1/5/15   |
| <i>Sylviocarcinus pictus</i> (H. Milne-Edwards 1853)  | N |   | 1/5/15   |

### Infraorder Caridea

|                                                                                     |   |   |                 |
|-------------------------------------------------------------------------------------|---|---|-----------------|
| <i>Atya scabra</i> (Leach, 1816) *                                                  |   | N | 1/6/15          |
| <i>Macrobrachium acanthurus</i> (Wiegmann, 1836)                                    |   | N | 1/7/8/9/10/15   |
| <i>Macrobrachium amazonicum</i> (Heller, 1862)                                      | N | N | 1/7/8/9/10/15   |
| <i>Macrobrachium brasiliense</i> (Heller, 1862)                                     | N | N | 1/7/8/9/10/15   |
| <i>Macrobrachium carcinus</i> (Linnaeus, 1758)                                      | N | N | 1/7/8/9/10/15   |
| <i>Macrobrachium denticulatum</i> Ostrovski, Da Fonseca & Da Silva-Ferreira, 1996 * |   | N | 1/11/15         |
| <i>Macrobrachium heterochirus</i> (Wiegmann, 1836)                                  |   | N | 1/7/8/9/10/15   |
| <i>Macrobrachium jelskii</i> (Miers, 1877)                                          | N | N | 1/7/8/9/10/15   |
| <i>Macrobrachium nattereri</i> (Heller, 1862)                                       | N |   | 1/7/8/9/10/15   |
| <i>Macrobrachium olfersi</i> (Wiegmann, 1836)                                       |   | N | 1/7/8/9/10/15   |
| <i>Macrobrachium rosenbergii</i> (De Man, 1879)                                     | I |   | 9               |
| <i>Macrobrachium surinamicum</i> Holthuis, 1948                                     | N |   | 1/7/8/9/10/15   |
| <i>Palaemon carteri</i> (Gordon, 1935)                                              | N |   | 1/9/10/12/13/15 |
| <i>Potimirim potimirim</i> (Müller, 1881)                                           |   | N | 1/14/15         |

### Suborder Dendrobranchiata

*Acetes marinus* Omori, 1975  
*Acetes paraguayensis* Hansen, 1919

N  
N

N

1/9/10/15  
1/9/10/15

**Aquatic  
Insects**

**EPHEMEROPTERA**

**Baetidae**

*Americabaetis*

N

N

1/2/3/4/5/6/7/8/9/10

*Apobaetis*

N

1/2/3/5/6/7/8/9/10

*Aturbina*

N

1/2/3/5/6/7/11

*Baetis*

N

12/13

*Baetodes* \*

N

N

1/2/3/5/6/7/8/12/13/14/15

*Callibaetis*

N

1/2/3/4/5/6/7/10

*Camelobaetidius* \*

N

N

1/2/3/5/6/7/8/9/10/14/15

*Cloeodes*

N

N

1/2/3/4/5/6/7/8/9/10/12/13/14/15/16

*Cryptonympha*

N

2/3/5/6/7/8

*Harpagobaetis*

N

9/10

*Moribaetis*

N

1

*Paracloeodes*

N

1/2/3/5/6/7/8

*Prebaetodes*

N

14/15

*Spiritiopts*

N

2/3/6/7

*Tupiara*

N

5/8

*Waltzoyphius*

N

N

1/2/3/5/6/7/8/9/10

*Zelus*

N

N

2/3/5/6/7/8/9/10

**Caenidae**

*Brasilocaenis*

N

N

11

*Caenis*

N

N

1/2/3/4/6/7/13/14

*Latineosus*

N

2/3/6/7

**Leptophlebiidae**

*Askola*

N

1/2/3/6/7

*Farrodes*

N

N

1/2/3/5/6/7/8/12/13/14/15

|                        |   |   |                         |
|------------------------|---|---|-------------------------|
| <i>Fittkaulus</i>      | N |   | 9/10                    |
| <i>Hagenulopsis</i>    | N | N | 2/3/5/6/7/8/14/15       |
| <i>Hagenulus</i>       |   | N | 1                       |
| <i>Hermanella</i> *    | N | N | 1/2/3/5/6/7/12/13/14/15 |
| <i>Homothraulus</i>    |   | N | 1/12                    |
| <i>Hydrosmilodon</i>   |   | N | 2/3/6/7                 |
| <i>Hylister</i>        |   | N | 5/8/12                  |
| <i>Leentvaaria</i>     | N |   | 14/15                   |
| <i>Massartela</i>      |   | N | 2/3/5/6/7/12/13         |
| <i>Massartellopsis</i> |   | N | 13                      |
| <i>Miroculis</i>       | N | N | 1/2/3/5/6/7/8/16        |
| <i>Needhamella</i>     | N | N | 1/2/3/6/7/14/15         |
| <i>Nousia</i>          |   | N | 1/13                    |
| <i>Paramaka</i>        |   | N | 2/3/6/7                 |
| <i>Simothraulopsis</i> |   | N | 2/3/6/7/10              |
| <i>Terpides</i>        | N | N | 1/2/3/6/7/9/10          |
| <i>Thraulodes</i>      | N | N | 1/2/3/5/6/7/8/11/14/15  |
| <i>Traverella</i> *    | N |   | 14/15                   |
| <i>Ulmeritoides</i>    | N | N | 2/3/6/7/14              |
| <b>Leptohyphidae</b>   |   |   |                         |
| <i>Leptohyphes</i>     | N | N | 1/2/3/5/6/7/8/14/15/16  |
| <i>Leptohyphodes</i>   | N |   | 14/15                   |
| <i>Traverhyphes</i>    | N | N | 2/3/4/5/6/7/8/10/13     |
| <i>Tricorythodes</i>   | N | N | 1/2/3/6/7/14/15         |
| <i>Tricorythopsis</i>  | N | N | 2/3/5/6/7/8/13/14/15    |
| <b>Euthyplociidae</b>  |   |   |                         |
| <i>Campylocia</i>      | N | N | 2/3/6/7/14              |
| <b>Ephemeridae</b>     |   |   |                         |
| <i>Hexagenia</i>       |   | N | 2/3/5/6/7               |

**Polymirtacyidae***Asthenopus*

N N

2/3/6/7

*Campsurus*

N N

2/3/6/7/14/15/17/46

**PLECOPTERA****Perlidae***Anacroneuria*

N N

2/3/5/6/8/13/14/15/18

*Enderleina*

N

13

*Kempnyia*

N

5/8/13

*Macrogynoplax*

N

2/3/5/6/8/13

**Gripopterygidae***Gripopteryx*

N

2/3/6

*Paragripopteryx*

N

5/13

*Tupiperla*

N

5/13

**TRICHOPTERA****Hydropsychidae***Leptonema*

N N

2/3/5/6/8/13/14/15/18/19/20

*Macronema*

N N

2/3/5/6/14/15/19/20

*Macrostemum*

N N

2/3/5/6/19/20

*Smicridea*

N N

2/3/5/6/8/12/13/14/15/18/19/20

*Synoestropsis*

N

14/15/20

**Leptoceridae***Amphoropsycha*

N

5

*Atanatolica*

N N

5/20

*Grumichella*

N

20

*Nectopsyche*

N N

2/3/5/6/8/13/14/19/20

*Oecetis*

N N

2/3/5/6/13/14/15/16/19/20

*Setodes*

N

18/20

*Triaenodes*

N

18

*Tripletides*

N N

2/3/6/13/19/20

**Odontoceridae**

|                |   |   |                 |
|----------------|---|---|-----------------|
| <i>Marilia</i> | N | N | 2/3/5/6/8/13/20 |
|----------------|---|---|-----------------|

|                    |   |   |           |
|--------------------|---|---|-----------|
| <i>Barypenthus</i> | N | N | 5/8/19/20 |
|--------------------|---|---|-----------|

**Calamoceratidae**

|                   |   |   |                                |
|-------------------|---|---|--------------------------------|
| <i>Phylloicus</i> | N | N | 2/3/5/6/8/13/14/16/18/19/20/47 |
|-------------------|---|---|--------------------------------|

**Ecnomidae**

|                      |   |   |             |
|----------------------|---|---|-------------|
| <i>Austrocinodes</i> | N | N | 2/3/6/19/20 |
|----------------------|---|---|-------------|

**Sericostomatidae**

|                 |  |   |     |
|-----------------|--|---|-----|
| <i>Grumicha</i> |  | N | 5/8 |
|-----------------|--|---|-----|

**Helicopsychidae**

|                     |   |   |                              |
|---------------------|---|---|------------------------------|
| <i>Helicopsyche</i> | N | N | 2/3/5/6/12/13/14/15/16/19/20 |
|---------------------|---|---|------------------------------|

**Hydrobiosidae**

|                  |   |   |                       |
|------------------|---|---|-----------------------|
| <i>Atopsyche</i> | N | N | 2/3/5/6/8/13/14/15/20 |
|------------------|---|---|-----------------------|

**Polycentropodidae**

|                  |   |   |       |
|------------------|---|---|-------|
| <i>Cernotina</i> | N | N | 13/20 |
|------------------|---|---|-------|

|                  |   |   |                                |
|------------------|---|---|--------------------------------|
| <i>Cyrnellus</i> | N | N | 2/3/5/6/8/13/14/15/16/18/19/20 |
|------------------|---|---|--------------------------------|

|                      |   |   |             |
|----------------------|---|---|-------------|
| <i>Polycentropus</i> | N | N | 2/3/6/18/20 |
|----------------------|---|---|-------------|

|                       |   |   |                       |
|-----------------------|---|---|-----------------------|
| <i>Polyplectropus</i> | N | N | 2/3/5/6/8/13/14/19/20 |
|-----------------------|---|---|-----------------------|

**Glossosomatidae**

|                    |  |   |   |
|--------------------|--|---|---|
| <i>Mexitrichia</i> |  | N | 5 |
|--------------------|--|---|---|

|                    |   |   |          |
|--------------------|---|---|----------|
| <i>Mortoniella</i> | N | N | 2/3/6/19 |
|--------------------|---|---|----------|

|                   |   |   |                   |
|-------------------|---|---|-------------------|
| <i>Protoptila</i> | N | N | 2/3/6/13/14/15/20 |
|-------------------|---|---|-------------------|

**Philopotamidae**

|                 |   |   |                           |
|-----------------|---|---|---------------------------|
| <i>Chimarra</i> | N | N | 2/3/5/6/13/14/15/18/19/20 |
|-----------------|---|---|---------------------------|

|                     |   |  |          |
|---------------------|---|--|----------|
| <i>Dolophilodes</i> | N |  | 18/19/20 |
|---------------------|---|--|----------|

|                  |   |   |             |
|------------------|---|---|-------------|
| <i>Wormaldia</i> | N | N | 2/3/6/13/19 |
|------------------|---|---|-------------|

**Hydroptilidae**

|                     |  |   |       |
|---------------------|--|---|-------|
| <i>Alisotrichia</i> |  | N | 2/3/6 |
|---------------------|--|---|-------|

|                     |   |   |          |
|---------------------|---|---|----------|
| <i>Anchitrichia</i> | N | N | 2/3/6/20 |
|---------------------|---|---|----------|

|                            |   |   |                               |
|----------------------------|---|---|-------------------------------|
| <i>Dicaminus</i>           | N |   | 14/15/20                      |
| <i>Hydroptila</i>          | N | N | 2/3/5/6/13/14/15/19/20        |
| <i>Metrichia</i>           | N | N | 2/3/6/19/21                   |
| <i>Neotrichia</i>          | N | N | 2/3/6/13/18/19/20             |
| <i>Ochrotrichia</i>        | N | N | 2/3/6/12/13/20                |
| <i>Oxyethira</i>           | N | N | 2/3/6/12/13/14/15/16/19/20/22 |
| <i>Taraxitrichia</i>       |   | N | 2/3/6                         |
| <i>Zumatrichia</i>         | N |   | 20                            |
| <b>Xiphocentronidae</b>    |   |   |                               |
| <i>Xiphocentron</i>        | N |   | 20                            |
| <b>ODONATA</b>             |   |   |                               |
| <b>Suborder Zygoptera</b>  |   |   |                               |
| <b>Coenagrionidae</b>      |   |   |                               |
| <i>Acanthagrion</i>        |   | N | 13                            |
| <i>Amphiagrion</i>         |   | N | 13                            |
| <i>Argia</i>               | N | N | 13/16/18                      |
| <i>Chromagrion</i>         |   | N | 13                            |
| <i>Enallagma</i>           |   | N | 13                            |
| <i>Leptobasis</i>          |   | N | 13                            |
| <i>Nehalania</i>           |   | N | 13                            |
| <b>Calopterigidae</b>      |   |   |                               |
| <i>Hetaerina</i>           | N | N | 13/16                         |
| <i>Mnesarete</i>           | N |   | 16                            |
| <b>Suborder Anisoptera</b> |   |   |                               |
| <b>Corduliidae</b>         |   |   |                               |
| <i>Macromia</i>            | N |   | 18                            |
| <b>Libellulidae</b>        |   |   |                               |
| <i>Dasythemis</i>          |   | N | 13                            |
| <i>Dythemis</i>            | N |   | 16                            |

|                             |   |   |       |
|-----------------------------|---|---|-------|
| <i>Erythemis</i>            |   | N | 13    |
| <i>Ladona</i>               |   | N | 13    |
| <i>Libellula</i>            |   | N | 13    |
| <i>Orthemis</i>             |   | N | 13    |
| <i>Perithemes</i>           | N | N | 13/18 |
| <b>Gomphidae</b>            |   |   |       |
| <i>Agrigomphus</i>          |   | N | 13    |
| <i>Arigomphus</i>           |   | N | 13    |
| <i>Epigomphus</i>           |   | N | 13    |
| <i>Erpetogomphus</i>        | N |   | 18    |
| <i>Gomphus</i>              |   | N | 13    |
| <i>Hagenius</i>             |   | N | 13    |
| <i>Neogomphus</i>           |   | N | 13    |
| <i>Praeviogomphus</i>       |   | N | 13    |
| <i>Octogomphus</i>          |   | N | 13    |
| <i>Phylogomphoides</i>      |   | N | 13    |
| <i>Progomphus</i>           |   | N | 13    |
| <i>Zonophora</i>            |   | N | 13    |
| <b>Aeshnidae</b>            |   |   |       |
| <i>Aeshna</i>               |   | N | 13    |
| <i>Anax</i>                 |   | N | 13    |
| <i>Coryphaeschna</i>        | N |   | 18    |
| <i>Gomphaeschna</i>         |   | N | 13    |
| <i>Gyanacantha</i>          |   | N | 13    |
| <b>HEMIPTERA</b>            |   |   |       |
| <b>Suborder Heteroptera</b> |   |   |       |
| <b>Pleidae</b>              |   |   |       |
| <i>Neoplea</i>              | N | N | 18/23 |
| <b>Naucoridae</b>           |   |   |       |

|                        |   |   |          |
|------------------------|---|---|----------|
| <i>Ambrysus</i>        | N | N | 18/23/24 |
| <i>Carvalhoiella</i>   |   | N | 24       |
| <i>Cryphocricos</i>    |   | N | 23/24    |
| <i>Ctenipocoris</i>    |   | N | 23       |
| <i>Limnocoris</i>      | N | N | 18/23/24 |
| <i>Pelocoris</i>       |   | N | 23       |
| <b>Notonectidae</b>    |   |   |          |
| <i>Buenoa</i>          |   | N | 13/23/24 |
| <i>Enithares</i>       |   | N | 24       |
| <i>Martarega</i>       |   | N | 23/24    |
| <i>Notonecta</i>       | N | N | 13/16/23 |
| <b>Ochteridae</b>      |   |   |          |
| <i>Ochterus</i>        |   | N | 23/24    |
| <b>Gelastocoridae</b>  |   |   |          |
| <i>Gelastocoris</i>    |   | N | 23/24    |
| <i>Montandonius</i>    |   | N | 24       |
| <i>Nerthra</i>         |   | N | 23       |
| <b>Gerridae</b>        |   |   |          |
| <i>Brachymetra</i>     |   | N | 23       |
| <i>Cylindrostethus</i> |   | N | 23       |
| <i>Halobatopsis</i>    |   | N | 23/24    |
| <i>Limnogonus</i>      |   | N | 23       |
| <i>Metrobates</i>      |   | N | 23       |
| <i>Neogerris</i>       |   | N | 13/23    |
| <i>Rheumatobates</i>   |   | N | 23       |
| <i>Tachygerris</i>     |   | N | 24       |
| <b>Veliidae</b>        |   |   |          |
| <i>Microvelia</i>      |   | N | 13/23/24 |
| <i>Paravelia</i>       |   | N | 23/24    |

|                       |   |   |                |
|-----------------------|---|---|----------------|
| <i>Platyvelia</i>     |   | N | 23             |
| <i>Rhagovelia</i>     |   | N | 13/23/24       |
| <i>Stridulivelia</i>  |   | N | 23             |
| <b>Mesoveliidae</b>   |   |   |                |
| <i>Mesovelia</i>      |   | N | 23             |
| <b>Hydrometridae</b>  |   |   |                |
| <i>Hydrometra</i>     |   | N | 23             |
| <b>Nepidae</b>        |   |   |                |
| <i>Curicta</i>        |   | N | 23             |
| <i>Ranatra</i>        |   | N | 13/23/24       |
| <b>Helotrephidae</b>  |   |   |                |
| <i>Neotrephes</i>     |   | N | 24             |
| <b>Hebridae</b>       |   |   |                |
| <i>Hebrus</i>         |   | N | 24             |
| <i>Lipogomphus</i>    |   | N | 23             |
| <b>Corixidae</b>      |   |   |                |
| <i>Centrocorisa</i>   |   | N | 23             |
| <i>Heterocorixa</i>   |   | N | 23             |
| <i>Sigara</i>         |   | N | 23             |
| <i>Tenagobia</i>      |   | N | 23/24          |
| <b>Belostomatidae</b> |   |   |                |
| <i>Belostoma</i>      |   | N | 13/23/24       |
| <i>Lethocerus</i>     |   | N | 23             |
| <b>MEGALOPTERA</b>    |   |   |                |
| <b>Corydalidae</b>    |   |   |                |
| <i>Corydalus</i>      | N | N | 13/18/25       |
| <b>DIPTERA</b>        |   |   |                |
| <b>Chaoboridae</b>    |   |   |                |
| <i>Chaoborus</i>      |   | N | 26/27/28/29/30 |

**Chironomidae****Subfamily Tanypodinae**

|                      |   |   |                                           |
|----------------------|---|---|-------------------------------------------|
| <i>Ablabesmyia</i>   | N | N | 13/17/21/26/28/29/30/31/32/33/34/35/36/37 |
| <i>Alotanypus</i>    | N | N | 27/28/29/30/35                            |
| <i>Clinotanypus</i>  |   | N | 13/17/21                                  |
| <i>Coelotanypus</i>  |   | N | 13/21/27/28/29/30/32/33/34/36/37/48       |
| <i>Djalmabatista</i> | N | N | 13/17/21/26/27/29/30/32/33/35/37/48       |
| <i>Fittkauimyia</i>  | N |   | 35                                        |
| <i>Labrundinia</i>   | N | N | 13/17/21/27/29/30/32/33/35/37             |
| <i>Larsia</i>        |   | N | 13/32/34                                  |
| <i>Macropelopia</i>  |   | N | 13                                        |
| <i>Monopelopia</i>   |   | N | 13                                        |
| <i>Pentaneura</i>    | N | N | 26/35                                     |
| <i>Procladius</i>    |   | N | 13/27/29/30/32/33/34                      |
| <i>Tanypus</i>       |   | N | 13/27/29/30/32/33/34/37                   |
| <i>Zavreliomyia</i>  |   | N | 13                                        |

**Subfamily Orthoclaadiinae**

|                         |   |   |                      |
|-------------------------|---|---|----------------------|
| <i>Corynoneura</i>      | N | N | 13/25/35             |
| <i>Cricotopus</i>       | N | N | 13/17/21/26/32/35/48 |
| <i>Ichthyocladius</i>   |   | N | 38                   |
| <i>Lopescladius</i>     |   | N | 21/26                |
| <i>Nanocladius</i>      | N | N | 13/17/35             |
| <i>Oliveriella</i>      |   | N | 32                   |
| <i>Onconeura</i>        |   | N | 21                   |
| <i>Orthocladius</i>     | N | N | 13/32/35             |
| <i>Paracladius</i>      | N |   | 35                   |
| <i>Parakiefferiella</i> | N |   | 35                   |
| <i>Parametriocnemus</i> | N |   | 35                   |
| <i>Thienemanniella</i>  | N | N | 13/21/26/32/35       |

**Subfamily Chironominae**

|                             |   |   |                                                    |
|-----------------------------|---|---|----------------------------------------------------|
| <i>Aedokritus</i>           |   | N | 21/27/28/29/30/33/34                               |
| <i>Apedilum</i>             | N | N | 13/34/35                                           |
| <i>Asheum</i>               |   | N | 34/37                                              |
| <i>Axarus</i>               |   | N | 21/32/37                                           |
| <i>Beardius</i>             | N | N | 13/27/29/30/32/33/35                               |
| <i>Caladomyia</i>           | N | N | 21/26/27/35/37                                     |
| <i>Cladopelma</i>           |   | N | 13/26/27/29/30/32/33/34                            |
| <i>Cladotanytarsus</i>      |   | N | 29/30                                              |
| <i>Chironomus</i>           | N | N | 13/17/21/26/27/28/29/30/31/32/33/34/35/36/37/39/48 |
| <i>Cryptochironomus</i>     | N | N | 13/21/26/27/29/30/31/32/33/35/37                   |
| <i>Demycryptochironomus</i> |   | N | 13/21                                              |
| <i>Dicrotendipes</i>        |   | N | 13/21/27/29/30/32/33/34/36/37                      |
| <i>Endotribelus</i>         | N | N | 13/26/35                                           |
| <i>Fissimentum</i>          |   | N | 13/17/21/27/28/29/30/31/33/34/37                   |
| <i>Goeldichironomus</i>     |   | N | 13/17/21/26/27/29/30/32/33/34/36/37                |
| <i>Lauterborniella</i>      |   | N | 27/29/30/33/34/37                                  |
| <i>Manoa</i>                |   | N | 27/29/30/33                                        |
| <i>Microchironomus</i>      |   | N | 21                                                 |
| <i>Nilothauma</i>           | N | N | 13/21/26/27/29/30/32/35/37                         |
| <i>Nimbocera</i>            |   | N | 27/29/30                                           |
| <i>Tanytarsus</i>           | N | N | 13/17/21/26/27/28/29/30/32/33/34/35/36/37          |
| <i>Tribelos</i>             |   | N | 13/32                                              |
| <i>Complexo Harnischia</i>  |   | N | 13/21/26/27/28/29/30                               |
| <i>Procladius</i>           |   | N | 27/28/29                                           |
| <i>Rheotanytarsus</i>       | N | N | 21/26/35                                           |
| <i>Riethia</i>              |   | N | 37                                                 |
| <i>Robackia</i>             |   | N | 21                                                 |
| <i>Parachironomus</i>       | N | N | 13/17/21/26/27/28/29/30/32/35/37                   |

|                                |   |   |                                              |
|--------------------------------|---|---|----------------------------------------------|
| <i>Paralauterboniella</i>      |   | N | 13/27/29/30/33                               |
| <i>Paratanytarsus</i>          |   | N | 37                                           |
| <i>Paratendipes</i>            | N | N | 26/34/35/37                                  |
| <i>Phaenopsectra</i>           |   | N | 13/32                                        |
| <i>Pelomus</i>                 |   | N | 27/29/30/33/37                               |
| <i>Polypedilum</i>             | N | N | 13/17/21/26/27/29/30/31/32/33/34/35/36/37/48 |
| <i>Pseudochironomus</i>        | N | N | 27/29/30/33/35/37                            |
| <i>Saetheria</i>               |   | N | 34                                           |
| <i>Stempellinella</i>          | N |   | 35                                           |
| <i>Stenochironomus</i>         |   | N | 13/27/29/30/32/33                            |
| <i>Xenochironomus</i>          |   | N | 32                                           |
| <i>Xestochironomus</i>         | N | N | 26/35                                        |
| <i>Zavreliella</i>             |   | N | 27/29/30/37                                  |
| <b>Simuliidae</b>              |   |   |                                              |
| <i>Simulium</i>                | N | N | 40/41/42/43/44/45                            |
| <b>COLEOPTERA</b>              |   |   |                                              |
| <b>Suborder Hydrophiloidea</b> |   |   |                                              |
| <b>Hydrophilidae</b>           |   |   |                                              |
| <i>Tropisternus</i>            | N |   | 16                                           |
| <b>Elmidae</b>                 |   |   |                                              |
| <i>Heterelmis</i>              | N | N | 13/16                                        |
| <i>Hexacylloepus</i>           | N |   | 16                                           |
| <i>Macrelmis</i>               | N | N | 13/18                                        |
| <i>Ordobrevia</i>              |   | N | 13                                           |
| <i>Phanocerus</i>              |   | N | 13                                           |
| <b>Psephenidae</b>             |   |   |                                              |
| <i>Psephenus</i>               |   | N | 13                                           |
| <b>Gyrinidae</b>               |   |   |                                              |
| <i>Gyretes</i>                 | N |   | 16                                           |

|                   |   |    |
|-------------------|---|----|
| <i>Gyrinus</i>    | N | 16 |
| <b>Dytiscidae</b> |   |    |
| <i>Hydaticus</i>  | N | 13 |
| <i>Hydrovatus</i> | N | 13 |

# **Freshwater Fish MYLIOBATIFORMES**

|                                                               |   |                    |
|---------------------------------------------------------------|---|--------------------|
| <i>Paratrygon aiereba</i> (Müller & Henle, 1841) *            | N | 1/2                |
| <i>Potamotrygon garmani</i> Fontenelle & Carvalho, 2017       | N | 3                  |
| <i>Potamotrygon henlei</i> (Castelnau, 1855)                  | N | 4                  |
| <i>Potamotrygon rex</i> Carvalho, 2016                        | N | 5                  |
| <i>Potamotrygon scobina</i> Garman, 1913                      | N | 3                  |
| <b>CLUPEIFORMES</b>                                           |   |                    |
| <i>Anchoviella jamesi</i> (Jordan & Seale, 1926)              | N | 4                  |
| <i>Anchoviella juruasanga</i> Loeb, 2012                      | N | 6                  |
| <i>Lycengraulis batesii</i> (Günther, 1868)                   | N | 1/4/7/8/9/10/11/12 |
| <i>Pellona castelnaeana</i> Valenciennes, 1847                | N | 1/4/7/9/10         |
| <b>CHARACIFORMES</b>                                          |   |                    |
| <i>Acestrocephalus acutus</i> Menezes, 2006                   | N | 13                 |
| <i>Acestrocephalus maculosus</i> Menezes, 2006                | N | 14                 |
| <i>Acestrocephalus stigmatus</i> Menezes, 2006                | N | 4/13               |
| <i>Acestrorhynchus britskii</i> Menezes, 1969                 | N | 15                 |
| <i>Acestrorhynchus falcatus</i> (Bloch, 1794)                 | N | 4/13               |
| <i>Acestrorhynchus lacustris</i> (Lütken, 1875)               | N | 13                 |
| <i>Acestrorhynchus microlepis</i> (Jardine, 1841)             | N | 1/4/7/8/11         |
| <i>Acinocheirodon melanogramma</i> Malabarba & Weitzman, 1999 | N |                    |
| <i>Acnodon Normani</i> Gosline, 1951                          | N | 4/13/16            |
| <i>Agoniatos halecinus</i> Müller & Troschel, 1845            | N | 1/4/9/10/11        |
| <i>Anodus orinocensis</i> (Steindachner, 1887)                | N | 1/4                |
| <i>Anostomoides laticeps</i> (Eigenmann, 1912)                | N | 1/7/12/17/18       |

|                                                                |   |   |                       |
|----------------------------------------------------------------|---|---|-----------------------|
| <i>Anostomus ternetzi</i> Fernández-Yépez, 1949                | N |   | 17                    |
| <i>Apareiodon argenteus</i> Pavanelli & Britski, 2003          | N |   | 14/16/19              |
| <i>Apareiodon cavalcante</i> Pavanelli & Britski, 2003         | N |   | 14/19                 |
| <i>Apareiodon ibitiensis</i> Amaral Campos, 1944               |   | N |                       |
| <i>Apareiodon machrisi</i> Travassos, 1957                     | N |   | 1/19/20/21/22/23      |
| <i>Apareiodon piracicabae</i> (Eigenmann, 1907)                |   | N |                       |
| <i>Apareiodon tigrinus</i> Pavanelli & Britski, 2003           | N |   | 19                    |
| <i>Argonectes robertsi</i> Langeani, 1999                      | N |   | 1/4/24/25/26/27       |
| <i>Astyanax argyrimarginatus</i> Garutti, 1999                 | N |   | 28                    |
| <i>Astyanax courensis</i> Bertaco, Carvalho & Jerep, 2010      | N |   | 23/29                 |
| <i>Astyanax elachylepis</i> Bertaco & Lucinda, 2005            | N |   | 30/31                 |
| <i>Astyanax fasciatus</i> (Cuvier, 1819)                       |   | N | 13                    |
| <i>Astyanax goyacensis</i> Eigenmann, 1908                     | N |   | 4/29/31/32            |
| <i>Astyanax goyanensis</i> (Miranda Ribeiro, 1944)             | N |   | 29/30                 |
| <i>Astyanax joaovitori</i> Oliveira, Pavanelli & Bertaco, 2017 | N |   |                       |
| <i>Astyanax lacustris</i> (Lütken, 1875)                       |   | N |                       |
| <i>Astyanax multidentis</i> Eigenmann, 1908                    | N |   | 33                    |
| <i>Astyanax novae</i> Eigenmann, 1911                          | N |   | 13                    |
| <i>Astyanax rivularis</i> (Lütken, 1875)                       |   | N |                       |
| <i>Astyanax unitaeniatus</i> Garutti, 1998                     | N |   | 14                    |
| <i>Astyanax xavante</i> Garutti & Venere, 2009                 | N |   | 34                    |
| <i>Bivibranchia fowleri</i> (Steindachner, 1908)               | N |   | 1/4/16/27             |
| <i>Bivibranchia notata</i> Vari & Goulding, 1985               | N |   | 4                     |
| <i>Bivibranchia velox</i> (Eigenmann & Myers, 1927)            | N |   | 1/4/16/27             |
| <i>Boulengerella cuvieri</i> (Spix & Agassiz, 1829)            | N |   | 4/9/10/11/13/35       |
| <i>Boulengerella maculata</i> (Valenciennes, 1850)             | N |   |                       |
| <i>Brachyhalcinus parnaibae</i> Reis, 1989                     | N |   |                       |
| <i>Brycon</i> cf. <i>pesu</i> Müller & Troschel, 1845          | N |   | 1/9/10/24/36          |
| <i>Brycon falcatus</i> Müller & Troschel, 1844                 | N |   | 1/9/10/24/25/35/37/38 |

|                                                                                        |   |   |                 |
|----------------------------------------------------------------------------------------|---|---|-----------------|
| <i>Brycon gouldingi</i> Lima, 2004                                                     | N | I | 1/4/25/37/38/39 |
| <i>Brycon nattereri</i> Günther, 1864 *                                                | N | N |                 |
| <i>Brycon orthotaenia</i> Günther, 1864 *                                              |   | N |                 |
| <i>Bryconamericus novae</i> Eigenmann & Henn, 1914                                     | N |   |                 |
| <i>Bryconops alburnoides</i> Kner, 1858                                                | N |   | 1/4/7/9         |
| <i>Bryconops melanurus</i> (Bloch, 1794)                                               | N |   | 4/31            |
| <i>Bryconops tocantinenses</i> Guedes, Oliveira & Lucinda, 2016                        | N |   | 40              |
| <i>Caenotropus labyrinthicus</i> (Kner, 1858)                                          | N |   | 4/7             |
| <i>Caiapobrycon tucurui</i> Malabarba & Vari, 2000                                     | N |   | 13              |
| <i>Chalceus macrolepidotus</i> Cuvier, 1818                                            | N |   | 4/35            |
| <i>Characidium bahiense</i> Almeida, 1971                                              |   | I | 13/41           |
| <i>Characidium lagosantense</i> Travassos, 1947                                        |   | N | 41              |
| <i>Characidium satoi</i> Melo & Oyakawa, 2015                                          |   | N |                 |
| <i>Characidium stigmosum</i> Melo & Buckup, 2002                                       | N |   | 41/42           |
| <i>Characidium xanthopteron</i> Silveira, Langeani, da Graça, Pavanelli & Buckup, 2008 | N |   | 43              |
| <i>Charax leticiae</i> Lucena, 1987                                                    | N |   | 7               |
| <i>Colossoma macropomum</i> (Cuvier, 1816)                                             | I | I | 4/25/39/44      |
| <i>Compsura heterura</i> Eigenmann, 1915                                               |   | N |                 |
| <i>Creagrutus atrisignum</i> Myers, 1927                                               | N |   | 14/23/45        |
| <i>Creagrutus britskii</i> Vari & Harold, 2001                                         | N |   | 13/16/31        |
| <i>Creagrutus figueiredoi</i> Vari & Harold, 2001                                      | N |   |                 |
| <i>Creagrutus menezesi</i> Vari & Harold, 2001                                         | N |   | 1               |
| <i>Creagrutus molinus</i> Vari & Harold, 2001                                          | N |   |                 |
| <i>Creagrutus mucipu</i> Vari & Harold, 2001                                           | N |   |                 |
| <i>Creagrutus saxatilis</i> Vari & Harold, 2001                                        | N |   | 13              |
| <i>Creagrutus seductus</i> Vari & Harold, 2001                                         | N |   |                 |
| <i>Ctenocheiroidon pristis</i> Malabarba & Jerep, 2012                                 | N |   |                 |
| <i>Curimata acutirostris</i> Vari & Reis, 1995                                         | N |   | 1/4/7/25        |
| <i>Curimata cyprinoides</i> (Linnaeus, 1766)                                           | N |   | 7/9/10/12/25/35 |

|                                                                |   |   |                                 |
|----------------------------------------------------------------|---|---|---------------------------------|
| <i>Curimata inornata</i> Vari, 1989                            | N |   | 1/4/12/25                       |
| <i>Curimatella alburnos</i> (Müller & Troschel, 1844)          | N |   |                                 |
| <i>Curimatella dorsalis</i> (Eigenmann & Eigenmann, 1889)      | N |   | 1/4                             |
| <i>Curimatella immaculata</i> (Fernández-Yépez, 1948)          | N |   | 1/7/16                          |
| <i>Curimatella lepidura</i> (Eigenmann & Eigenmann, 1889)      |   | N | 15                              |
| <i>Cynopotamus gouldingi</i> Menezes, 1987                     | N |   |                                 |
| <i>Cynopotamus tocantinenses</i> Menezes, 1987                 | N |   |                                 |
| <i>Cyphocharax boiadeiro</i> Melo, 2017                        | N |   | 46                              |
| <i>Cyphocharax gouldingi</i> Vari, 1992                        | N |   | 1/4                             |
| <i>Cyphocharax leucostictus</i> (Eigenmann & Eigenmann, 1889)  | N |   | 1/4                             |
| <i>Cyphocharax notatus</i> (Steindachner, 1908)                | N |   | 1/4                             |
| <i>Cyphocharax plumbeus</i> (Eigenmann & Eigenmann, 1889)      | N |   | 1/4/16                          |
| <i>Cyphocharax stilbolepis</i> Vari, 1992                      | N |   | 1/4                             |
| <i>Exodon paradoxus</i> Müller & Troschel, 1844                | N |   | 1/4/16                          |
| <i>Galeocharax gulo</i> (Cope, 1870)                           | N |   | 4/47/51                         |
| <i>Hasemanian crenuchoides</i> Zarske & Géry, 1999 *           | N |   | 23                              |
| <i>Hasemanian kalunga</i> Bertaco & Carvalho, 2010             | N |   | 48                              |
| <i>Hasemanian nana</i> (Lütken, 1875)                          |   | N | 13                              |
| <i>Hemibrycon surinamensis</i> Géry, 1962                      | N |   | 49                              |
| <i>Hemigrammus ataktos</i> Marinho, Dagosta & Birindelli, 2014 | N |   | 50                              |
| <i>Hemigrammus brevis</i> Ellis, 1911                          |   | N | 13                              |
| <i>Hemigrammus marginatus</i> Ellis, 1911                      |   | N | 13                              |
| <i>Hemigrammus ora</i> Zarske, Le Bail & Géry, 2006            | N |   | 52                              |
| <i>Hemigrammus tocantinsi</i> Carvalho, Bertaco & Jerep, 2010  | N |   | 53                              |
| <i>Hemiodus microlepis</i> Kner, 1858                          | N |   | 1/4/7/9/10/24/26/27             |
| <i>Hemiodus ternetzi</i> Myers, 1927                           | N |   | 13/20/21/27                     |
| <i>Hemiodus tocantinenses</i> Langeani, 1999                   | N |   | 4                               |
| <i>Hemiodus unimaculatus</i> (Bloch, 1794)                     | N |   | 1/4/8/9/10/12/13/16/26/27/35/37 |
| <i>Hoplerythrinus unitaeniatus</i> (Spix & Agassiz, 1829)      | N | N | 13/43                           |

|                                                                   |   |   |                                  |
|-------------------------------------------------------------------|---|---|----------------------------------|
| <i>Hoplias aimara</i> (Valenciennes, 1847)                        | N |   | 13                               |
| <i>Hoplias curupira</i> Oyakawa & Mattox, 2009                    | N |   | 4/54                             |
| <i>Hoplias intermedius</i> (Günther, 1864)                        |   | N |                                  |
| <i>Hoplias lacerdae</i> Miranda Ribeiro, 1908                     |   | I | 39                               |
| <i>Hoplias malabaricus</i> (Bloch, 1794)                          | N |   | 1/13/20/22/54/55/56              |
| <i>Hoplias microcephalus</i> (Agassiz, 1829)                      |   | N |                                  |
| <i>Hydrolycus armatus</i> (Jardine, 1841)                         | N |   | 1/4/9/10/11/12/24/25/26/35/37/57 |
| <i>Hydrolycus tatauaia</i> Toledo-Piza, Menezes & Santos, 1999    | N |   | 1/4/9/10/13/25/35/57             |
| <i>Hyphessobrycon amandae</i> Géry & Uj, 1987                     | N |   |                                  |
| <i>Hyphessobrycon diastatos</i> Dagosta, Marinho & Camelier, 2014 | N | N | 58                               |
| <i>Hyphessobrycon eilyos</i> Lima & Moreira, 2003 *               | N |   | 59/60                            |
| <i>Hyphessobrycon hamatus</i> Bertaco & Malabarba, 2005           | N |   | 14/60                            |
| <i>Hyphessobrycon haraldschultzi</i> Travassos, 1960              | N |   | 60                               |
| <i>Hyphessobrycon langeanii</i> Lima & Moreira, 2003              | N |   | 58/60                            |
| <i>Hyphessobrycon loweae</i> Costa & Géry, 1994                   | N |   | 61                               |
| <i>Hyphessobrycon micropterus</i> (Eigenmann, 1915)               |   | N | 13/58                            |
| <i>Hyphessobrycon moniliger</i> Moreira, Lima & Costa, 2002       | N |   | 60                               |
| <i>Hyphessobrycon santae</i> (Eigenmann, 1907)                    |   | N |                                  |
| <i>Hyphessobrycon stegemanni</i> Géry, 1961                       | N |   | 13/60                            |
| <i>Hyphessobrycon weitzmanorum</i> Lima & Moreira, 2003           | N |   | 59/60                            |
| <i>Hysteronotus megalostomus</i> Eigenmann, 1911 *                |   | N |                                  |
| <i>Iguanodectes spilurus</i> (Günther, 1864)                      | N |   | 1/4/51                           |
| <i>Jupiaba acanthogaster</i> (Eigenmann, 1911)                    | N |   | 1/4                              |
| <i>Jupiaba apenima</i> Zanata, 1997                               | N |   | 31/62                            |
| <i>Jupiaba elassonaktis</i> Pereira & Lucinda, 2007               | N |   | 63                               |
| <i>Jupiaba polylepis</i> (Günther, 1864)                          | N |   | 1/4/16/51                        |
| <i>Knodus breviceps</i> (Eigenmann, 1908)                         | N |   |                                  |
| <i>Knodus figueiredoi</i> Esguícero & Castro, 2014                | N |   | 64                               |
| <i>Knodus savannensis</i> Géry, 1961                              | N |   | 13                               |

|                                                                        |   |   |                                      |
|------------------------------------------------------------------------|---|---|--------------------------------------|
| <i>Kolpotocheiroduon theloura</i> Malabarba & Weitzman, 2000 *         |   | N |                                      |
| <i>Laemolyta fernandezi</i> Myers, 1950                                | N |   | 1/4/9/10/17/18/26/65                 |
| <i>Laemolyta taeniata</i> (Kner, 1859)                                 | N |   | 1/9/10/17/18                         |
| <i>Lepidocharax burnsi</i> Ferreira, Menezes & Quagio-Grassiotto, 2011 |   | N |                                      |
| <i>Leporellus pictus</i> (Kner, 1858)                                  |   | N |                                      |
| <i>Leporellus vittatus</i> Valenciennes, 1849                          | N | N | 1/4/17/20/26/37/65                   |
| <i>Leporinus affinis</i> Günther, 1864                                 | N |   | 1/4/7/8/9/10/17/18/26/35/37          |
| <i>Leporinus bimaculatus</i> Castelnau, 1855                           | N |   |                                      |
| <i>Leporinus bistratus</i> Britski, 1997 *                             | N |   | 13                                   |
| <i>Leporinus desmotes</i> Fowler, 1914                                 | N |   | 1/4/9/10/17/37                       |
| <i>Leporinus elongatus</i> Valenciennes, 1850                          |   | I | 43                                   |
| <i>Leporinus friderici</i> Bloch, 1794                                 | N |   | 1/4/7/8/9/10/17/18/26/35/37/44/51/62 |
| <i>Leporinus geminis</i> Garavello & Santos, 2009                      | N |   | 1/26/67                              |
| <i>Leporinus maculatus</i> Müller & Troschel, 1844                     | N |   | 4/67                                 |
| <i>Leporinus marcgravii</i> Lütken, 1875                               |   | N |                                      |
| <i>Leporinus multimaculatus</i> Birindelli, Teixeira & Britski, 2016   | N |   |                                      |
| <i>Leporinus piau</i> Fowler, 1941                                     |   | I | 13                                   |
| <i>Leporinus santosi</i> Britski & Birindelli, 2013                    | N |   | 68                                   |
| <i>Leporinus taeniatus</i> Lütken, 1875                                |   | N | 13                                   |
| <i>Leporinus taeniofasciatus</i> Britski, 1997 *                       | N |   | 14/69                                |
| <i>Leporinus tigrinus</i> Borodin, 1929                                | N |   | 4/13/17/26/35/37                     |
| <i>Leporinus tristriatus</i> Birindelli & Britski, 2013                | N |   |                                      |
| <i>Leporinus unitaeniatus</i> Garavello & Santos, 2009                 | N |   | 1/4/7/26/67                          |
| <i>Leporinus venerei</i> Britski & Birindelli, 2008                    | N |   | 16/70                                |
| <i>Megaleporinus obtusidens</i> (Valenciennes, 1837)                   |   | N |                                      |
| <i>Megaleporinus reinhardti</i> (Lütken, 1875)                         |   | N | 15/39                                |
| <i>Megaleporinus trifasciatus</i> (Steindachner, 1876)                 | N |   | 7/17/18/37/71                        |
| <i>Melanocharacidium auroradiatum</i> Costa & Vicente, 1994            | N |   | 1                                    |
| <i>Metynnis maculatus</i> (Kner, 1858)                                 | N | I | 1/15/39/44                           |

|                                                                     |   |   |                               |
|---------------------------------------------------------------------|---|---|-------------------------------|
| <i>Metynnis lippincottianus</i> (Cope, 1870)                        |   | I | 72                            |
| <i>Moenkhausia alesi</i> Petrolli & Benine, 2015                    | N |   |                               |
| <i>Moenkhausia aurantia</i> Bertaco, Jerep & Carvalho, 2011         | N |   | 23/73                         |
| <i>Moenkhausia costae</i> (Steindachner, 1907)                      |   | N | 15                            |
| <i>Moenkhausia dasalmas</i> Bertaco, Jerep & Carvalho, 2011         | N |   | 74                            |
| <i>Moenkhausia hysteropectica</i> Lucinda, Malabarba & Benine, 2007 | N |   | 75                            |
| <i>Moenkhausia loweae</i> Géry, 1992                                | N |   | 15/76                         |
| <i>Moenkhausia pankilopteryx</i> Bertaco & Lucinda, 2006            | N |   | 31/76                         |
| <i>Moenkhausia pyrophthalma</i> Costa, 1994                         | N |   | 1/76                          |
| <i>Moenkhausia sanctaefilomenae</i> (Steindachner, 1907)            | N | N | 13/16                         |
| <i>Moenkhausia tergimacula</i> Lucena & Lucena, 1999                | N |   | 4/13/14/76                    |
| <i>Moenkhausia venerei</i> Petrolli, Azevedo-Santos & Benine, 2016  | N |   |                               |
| <i>Mylesinus paucisquamatus</i> Jégu & Santos, 1988 *               | N |   | 4/13/20/21/77/78              |
| <i>Myleus altipinnis</i> (Valenciennes, 1850)                       |   | N |                               |
| <i>Myleus micans</i> (Lütken, 1875)                                 |   | N |                               |
| <i>Myleus setiger</i> Müller & Troschel, 1844                       | N |   | 1/4/26/35                     |
| <i>Myloplus arnoldi</i> Ahl, 1936                                   | N |   | 1                             |
| <i>Myloplus torquatus</i> (Kner, 1858)                              | N |   | 1/4/9/10/11/13/16/24/25/35/37 |
| <i>Mylossoma duriventre</i> (Cuvier, 1818)                          | N |   | 1/35/37/44                    |
| <i>Orthospinus franciscensis</i> (Eigenmann, 1914)                  |   | N | 13                            |
| <i>Parodon hilarii</i> Reinhardt, 1867                              |   | N |                               |
| <i>Phenacogaster franciscoensis</i> Eigenmann, 1911                 |   | N | 13                            |
| <i>Piabarchus stramineus</i> (Eigenmann, 1908)                      |   | N |                               |
| <i>Piabina argentea</i> Reinhardt, 1867                             |   | N |                               |
| <i>Piaractus brachypomus</i> (Cuvier, 1818)                         | N |   | 1/4/8/25/26/37                |
| <i>Piaractus mesopotamicus</i> (Holmberg, 1887)                     | I | I | 25/39/44                      |
| <i>Poptella compressa</i> (Günther, 1864)                           | N |   | 1/4                           |
| <i>Poptella longipinnis</i> (Popta, 1901)                           | N |   | 7/51                          |
| <i>Prochilodus argenteus</i> Spix & Agassiz, 1829                   |   | N |                               |

|                                                            |   |   |                                 |
|------------------------------------------------------------|---|---|---------------------------------|
| <i>Prochilodus brevis</i> Steindachner, 1875               |   | N |                                 |
| <i>Prochilodus costatus</i> Valenciennes, 1850             |   | N |                                 |
| <i>Prochilodus nigricans</i> Spix & Agassiz, 1829          | N |   | 1/4/7/9/10/16/24/25/26/35/37/79 |
| <i>Psectrogaster amazônica</i> Eigenmann & Eigenmann, 1889 | N |   | 1/4/7/12/24/25                  |
| <i>Psellogrammus kennedyi</i> (Eigenmann, 1903)            |   | N |                                 |
| <i>Pygocentrus nattereri</i> Kner, 1858                    | N | I | 1/9/10/11/43                    |
| <i>Pygocentrus piraya</i> (Cuvier, 1819)                   |   | N |                                 |
| <i>Rhaphiodon vulpinus</i> Spix & Agassiz, 1829            | N |   | 1/4/7/9/10/11/24/25/35/37/80/81 |
| <i>Rhinopetitia myersi</i> Géry, 1964                      | N |   |                                 |
| <i>Roeboexodon geryi</i> Myers, 1960                       | N |   | 1                               |
| <i>Roeboexodon guyanensis</i> (Puyo, 1948)                 | N |   | 4/12                            |
| <i>Roeboides affinis</i> (Günther, 1868)                   | N |   | 1/4/7/16/82/83                  |
| <i>Roeboides xenodon</i> (Reinhardt, 1851)                 |   | N |                                 |
| <i>Roestes Itupiranga</i> Menezes & Lucena, 1998 *         | N |   |                                 |
| <i>Salminus franciscanus</i> Lima & Britski, 2007 *        |   | N |                                 |
| <i>Salminus hilarii</i> Valenciennes, 1850                 | N |   | 25                              |
| <i>Sartor tucuruiense</i> Santos & Jégu, 1987 *            | N |   | 17                              |
| <i>Schizodon knerii</i> (Steindachner, 1875)               |   | N |                                 |
| <i>Schizodon vittatus</i> (Valenciennes, 1850)             | N |   | 1/4/7/9/10/12/17/18/26/35       |
| <i>Semaprochilodus brama</i> (Valenciennes, 1850)          | N |   | 1/7/9/10/12/24/25/37            |
| <i>Serrapinnus aster</i> Malabarba & Jerep, 2014           | N |   | 84                              |
| <i>Serrapinnus heterodon</i> (Eigenmann, 1915)             |   | N |                                 |
| <i>Serrapinnus lucindai</i> Jerep & Malabarba, 2014        | N |   | 84                              |
| <i>Serrapinnus piaba</i> (Lütken, 1875)                    |   | N | 13                              |
| <i>Serrapinnus sterbai</i> Zarske, 2012                    | N |   | 84                              |
| <i>Serrapinnus tocantinenses</i> Malabarba & Jerep, 2014   | N |   | 84                              |
| <i>Serrasalmus brandtii</i> Lütken, 1875                   |   | N | 15                              |
| <i>Serrasalmus geryi</i> Jégu & Santos, 1988               | N |   | 1/7/9/10                        |
| <i>Serrasalmus gibbus</i> Castelnau, 1855                  | N |   | 1/4/7/9/10/12                   |

|                                                                                  |   |   |                            |
|----------------------------------------------------------------------------------|---|---|----------------------------|
| <i>Serrasalmus rhombeus</i> (Linnaeus, 1766)                                     | N |   | 4/7/9/10/11/12/24/26/35/37 |
| <i>Steindachnerina amazônica</i> (Steindachner, 1911)                            | N |   | 4/31/35                    |
| <i>Steindachnerina gracilis</i> Vari & Williams Vari, 1989                       | N |   | 1/16                       |
| <i>Steindachnerina notograptos</i> Lucinda & Vari, 2009                          | N |   | 85                         |
| <i>Stygichthys typhlops</i> Brittan & Böhlke, 1965 *                             |   | N |                            |
| <i>Tetragonopterus akamai</i> Araujo & Lucinda, 2014                             | N |   | 86                         |
| <i>Tetragonopterus anostomus</i> Silva & Benine, 2011                            | N |   | 87                         |
| <i>Tetragonopterus araguaiensis</i> Silva, Melo, Oliveira & Benine, 2013         | N |   | 88                         |
| <i>Tetragonopterus argenteus</i> Cuvier, 1816                                    | N |   | 4/9/10/16/51/62/88         |
| <i>Tetragonopterus chalceus</i> Spix & Agassiz, 1829                             | N | N | 1/4/10/15/26/39/88         |
| <i>Tetragonopterus denticulatus</i> Silva, Melo, Oliveira & Benine, 2013         | N |   | 88                         |
| <i>Tetragonopterus franciscoensis</i> Silva, Melo, Oliveira & Benine, 2016       |   | N |                            |
| <i>Thayeria boehlkei</i> Weitzman, 1957                                          | N |   | 1/51                       |
| <i>Thoracocharax stellatus</i> (Kner, 1858)                                      | N |   | 6/50/89/90                 |
| <i>Tometes ancylorhynchus</i> Andrade, Jégu & Giarrizzo, 2016                    | N |   | 91                         |
| <i>Tometes siderocarajensis</i> Andrade, Machado, Jégu, Farias & Giarrizzo, 2017 | N |   | 91                         |
| <i>Triportheus albus</i> Cope, 1872                                              | N |   | 1/4/8/9/10/35              |
| <i>Triportheus angulatus</i> (Spix & Agassiz, 1829)                              | N |   | 7/44                       |
| <i>Triportheus guentheri</i> (Garman, 1890)                                      |   | N | 15                         |
| <i>Triportheus trifurcatus</i> (Castelnau, 1855)                                 | N |   | 1/4/9/10/16/24/26/37/92    |
| <i>Xenrobrycon coracoralinae</i> Moreira, 2005                                   | N |   | 93                         |
| <b>GYMNOTIFORMES</b>                                                             |   |   |                            |
| <i>Apteronotus camposdapazi</i> de Santana & Lehmann, 2006                       | N |   | 94                         |
| <i>Archolaemus blax</i> Korringa, 1970                                           | N |   | 13/95                      |
| <i>Brachyhypopomus menezesi</i> Crampton, de Santana, Waddell & Lovejoy, 2017    |   | N |                            |
| <i>Brachyhypopomus regani</i> Crampton, de Santana, Waddell & Lovejoy, 2017      | N |   | 96                         |
| <i>Eigenmannia besouro</i> Peixoto & Wosiacki, 2016                              |   | N |                            |
| <i>Eigenmannia microstoma</i> (Reinhardt, 1852)                                  |   | N |                            |
| <i>Eigenmannia vicentespela</i> Triques, 1996 *                                  | N |   | 97                         |

|                                                                               |   |   |                     |
|-------------------------------------------------------------------------------|---|---|---------------------|
| <i>Electrophorus electricus</i> (Linnaeus, 1766)                              | N |   | 4                   |
| <i>Gymnorhamphichthys petiti</i> Géry & Vu, 1964                              | N |   | 1                   |
| <i>Gymnotus carapo</i> Linnaeus, 1758                                         | N |   | 1/4/20/21/31/98     |
| <i>Rhamphichthys marmoratus</i> Castelnau, 1855                               | N |   | 1                   |
| <i>Sternarchorhynchus axelrodi</i> de Santana & Vari, 2010 *                  | N |   |                     |
| <i>Sternarchorhynchus mesensis</i> Campos-da-Paz, 2000                        | N |   | 14                  |
| <i>Sternarchorhynchus schwassmanni</i> de Santana & Vari, 2010                | N |   |                     |
| <i>Sternarchorhynchus starksi</i> de Santana & Vari, 2010                     | N |   |                     |
| <i>Sternopygus macrurus</i> (Bloch & Schneider, 1801)                         | N | N | 1/13/20/21/31/35/62 |
| <i>Sternopygus Xingu</i> Albert & Fink, 1996                                  | N |   |                     |
| <b>SILURIFORMES</b>                                                           |   |   |                     |
| <i>Acanthicus adônis</i> Isbrücker & Nijssen, 1988                            | N |   | 99                  |
| <i>Acanthicus hystrix</i> Spix & Agassiz, 1829                                | N |   | 99                  |
| <i>Ageneiosus inermis</i> (Linnaeus, 1766)                                    | N |   | 1/4/9/10            |
| <i>Ageneiosus ucayalensis</i> Castelnau, 1855                                 | N |   | 1/4                 |
| <i>Aguarunichthys tocantinsensis</i> Zuanon, Rapp Py-Daniel & Jégu, 1993 *    | N |   | 13/78               |
| <i>Ammoglanis diaphanus</i> Costa, 1994                                       | N |   |                     |
| <i>Ancistomus micrommatos</i> (Cardoso & Lucinda, 2003)                       | N |   |                     |
| <i>Ancistomus spilomma</i> (Cardoso & Lucinda, 2003)                          | N |   | 100                 |
| <i>Ancistomus spinosissimus</i> (Cardoso & Lucinda, 2003)                     | N |   | 100                 |
| <i>Ancistrus aguaboensis</i> Fisch-Muller, Mazzoni & Weber, 2001              | N |   | 14/20/21/23         |
| <i>Ancistrus cryptophthalmus</i> Reis, 1987 *                                 | N |   | 101/102/103         |
| <i>Ancistrus jataiensis</i> Fisch-Muller, Cardoso, da Silva & Bertaco, 2005   | N |   | 14/104              |
| <i>Ancistrus karajas</i> de Oliveira, Rapp Py-Daniel, Zawadzki & Zuanon, 2016 | N |   | 105                 |
| <i>Ancistrus minutus</i> Fisch-Muller, Mazzoni & Weber, 2001 *                | N |   | 14/20/21/22         |
| <i>Ancistrus ranunculus</i> Muller, Rapp Py-Daniel & Zuanon, 1994 *           | N |   |                     |
| <i>Ancistrus reisi</i> Fisch-Muller, Cardoso, da Silva & Bertaco, 2005        | N |   | 104                 |
| <i>Ancistrus stigmaticus</i> Eigenmann & Eigenmann, 1889                      | N |   |                     |
| <i>Aspidoras albater</i> Nijssen & Isbrücker, 1976                            | N |   | 14/107/108          |

|                                                                          |   |   |                        |
|--------------------------------------------------------------------------|---|---|------------------------|
| <i>Aspidoras belenos</i> Britto, 1998                                    | N |   |                        |
| <i>Aspidoras brunneus</i> Nijssen & Isbrücker, 1976                      | N |   |                        |
| <i>Aspidoras eurycephalus</i> Nijssen & Isbrücker, 1976                  | N |   | 14/23                  |
| <i>Aspidoras gabrieli</i> Wosiacki, Graças Pereira & Reis, 2014          | N |   | 109                    |
| <i>Aspidoras mephisto</i> Tencatt & Bichuette, 2017                      | N |   | 110                    |
| <i>Aspidoras pauciradiatus</i> (Weitzman & Nijssen, 1970)                | N |   |                        |
| <i>Aspidoras poecilus</i> Nijssen & Isbrücker, 1976                      | N |   | 31                     |
| <i>Aspidoras velites</i> Britto, Lima & Moreira, 2002                    | N |   | 106                    |
| <i>Auchenipterichthys coracoideus</i> (Eigenmann & Allen, 1942)          | N |   | 4/9/10                 |
| <i>Auchenipterus nuchalis</i> (Spix & Agassiz, 1829)                     | N |   | 1/4/7/8/9/10/24/35/111 |
| <i>Auchenipterus osteomystax</i> (Miranda Ribeiro, 1918)                 | N |   | 4/111                  |
| <i>Bagropsis reinhardti</i> Lütken, 1874 *                               |   | N |                        |
| <i>Baryancistrus longipinnis</i> (Kindle, 1895) *                        | N |   |                        |
| <i>Baryancistrus niveatus</i> (Castelnau, 1855) *                        | N |   | 1/4/35/37              |
| <i>Bergiaria westermanni</i> (Lütken, 1874)                              |   | N |                        |
| <i>Bunocephalus minerim</i> Carvalho, Cardoso, Friel & Reis, 2015        |   | N |                        |
| <i>Centromochlus bockmanni</i> (Sarmiento-Soares & Buckup, 2005)         |   | N |                        |
| <i>Centromochlus ferrarisi</i> Birindelli, Sarmiento-Soares & Lima, 2015 | N |   | 112                    |
| <i>Centromochlus schultzi</i> Rössel, 1962                               | N |   | 4/112                  |
| <i>Cephalosilurus fowleri</i> Haseman, 1911                              |   | N | 13                     |
| <i>Cetopsis arcana</i> Vari, Ferraris & de Pinna, 2005                   | N |   | 113                    |
| <i>Cetopsis caiapo</i> Vari, Ferraris & de Pinna, 2005                   | N |   | 14/113                 |
| <i>Cetopsis coecutiens</i> (Lichtenstein, 1819)                          | N |   | 4/14/113               |
| <i>Cetopsis gobioides</i> Kner, 1858                                     |   | N |                        |
| <i>Cetopsis sarcodes</i> Vari, Ferraris & de Pinna, 2005                 | N |   | 14/113                 |
| <i>Cetopsorhamdia iheringi</i> Schubart & Gomes, 1959                    |   | N | 13                     |
| <i>Cetopsorhamdia molinae</i> Miles, 1943                                | N |   | 20/21                  |
| <i>Clarias gariepinus</i> (Burchell, 1822)                               |   | I | 39/114/115             |
| <i>Conorhynchus conirostris</i> (Valenciennes, 1840) *                   |   | N |                        |

|                                                                           |   |   |                  |
|---------------------------------------------------------------------------|---|---|------------------|
| <i>Corumbataia tocantinenses</i> Britski, 1997                            | N |   | 20/21/23         |
| <i>Corumbataia veadeiros</i> Carvalho, 2008                               | N |   | 116              |
| <i>Corydoras araguaiaensis</i> Sands, 1990                                | N |   | 117              |
| <i>Corydoras cochui</i> Myers & Weitzman, 1954                            | N |   |                  |
| <i>Corydoras costai</i> Ottoni, Barbosa & Katz, 2016                      |   | N |                  |
| <i>Corydoras difluviatilis</i> Britto & Castro, 2002                      |   | N |                  |
| <i>Corydoras eversi</i> Tencatt & Britto, 2016                            | N |   | 117              |
| <i>Corydoras garbei</i> Ihering, 1911                                     |   | N |                  |
| <i>Corydoras lyrnades</i> Tencatt, Vera-Alcaraz, Britto & Pavanelli, 2013 |   | N |                  |
| <i>Corydoras maculifer</i> Nijssen & Isbrücker, 1971                      | N |   | 117              |
| <i>Corydoras multimaculatus</i> Steindachner, 1907                        |   | N | 13               |
| <i>Curculionichthys sagarana</i> Roxo, Silva, Ochoa & Oliveira, 2015      |   | N |                  |
| <i>Curculionichthys tucana</i> Roxo, Dias, Silva & Oliveira, 2017         | N |   | 118              |
| <i>Denticetopsis epa</i> Vari, Ferraris & de Pinna, 2005                  | N |   | 113              |
| <i>Doras zuanoni</i> Sabaj Pérez & Birindelli, 2008                       | N |   | 1/119            |
| <i>Duopalatinus emarginatus</i> (Valenciennes, 1840)                      |   | N |                  |
| <i>Farlowella amazonum</i> (Günther, 1864)                                | N |   | 1/51             |
| <i>Farlowella henriquei</i> Miranda Ribeiro, 1918                         | N |   | 4                |
| <i>Franciscodoras marmoratus</i> (Lütken, 1874)                           |   | N |                  |
| <i>Gelanoglanis varii</i> Calegari & Reis, 2016                           | N |   | 120              |
| <i>Gymnotocinclus anosteos</i> Carvalho, Lehmann & Reis, 2008             | N |   | 14/121           |
| <i>Gymnotocinclus canoeiro</i> Roxo, Silva, Ochoa & Zawadzki, 2017        | N |   | 122              |
| <i>Harttia duriventris</i> Rapp Py-Daniel & Oliveira, 2001                | N |   |                  |
| <i>Harttia leiopleura</i> Oyakawa, 1993                                   |   | N |                  |
| <i>Harttia longipinna</i> Langeani, Oyakawa & Montoya-Burgos, 2001        |   | N |                  |
| <i>Harttia novalimensis</i> Oyakawa, 1993                                 |   | N |                  |
| <i>Harttia punctata</i> Rapp Py-Daniel & Oliveira, 2001                   | N |   | 4/13/20/21/22/23 |
| <i>Harttia torrenticola</i> Oyakawa, 1993                                 |   | N |                  |
| <i>Hassar wilderi</i> Kindle, 1895                                        | N |   | 4/9/10/11/61/123 |

|                                                                        |   |   |                  |
|------------------------------------------------------------------------|---|---|------------------|
| <i>Hemiancistrus cerrado</i> de Souza, Melo, Chamon & Armbruster, 2008 | N |   | 124              |
| <i>Hemisorubim platyrhynchos</i> (Valenciennes, 1840)                  | N |   | 1/4/7/9/10/25/35 |
| <i>Henonemus intermedius</i> (Eigenmann & Eigenmann, 1889)             | N |   |                  |
| <i>Hisonotus bocaiuva</i> Roxo, Silva, Oliveira & Zawadzki, 2013       |   | N |                  |
| <i>Hisonotus vespucii</i> Roxo, Silva & Oliveira, 2015                 |   | N |                  |
| <i>Hypophthalmus marginatus</i> Valenciennes, 1840                     | N |   | 4                |
| <i>Hypoptopoma muzuspi</i> Aquino & Schaefer, 2010                     | N |   |                  |
| <i>Hypostomus alatus</i> Castelnau, 1855                               |   | N |                  |
| <i>Hypostomus asperatus</i> Castelnau, 1855                            | N |   |                  |
| <i>Hypostomus atropinnis</i> (Eigenmann & Eigenmann, 1890)             | N |   |                  |
| <i>Hypostomus delimai</i> Zawadzki, de Oliveira & Debona, 2013         | N |   | 4/125            |
| <i>Hypostomus ericae</i> Hollanda Carvalho & Weber, 2005               | N |   | 4/14/21          |
| <i>Hypostomus faveolus</i> Zawadzki, Birindelli & Lima, 2008           | N |   | 4/126            |
| <i>Hypostomus francisci</i> (Lütken, 1874)                             |   | N |                  |
| <i>Hypostomus garmani</i> (Regan, 1904)                                |   | N |                  |
| <i>Hypostomus goyazensis</i> (Regan, 1908)                             | N |   |                  |
| <i>Hypostomus lima</i> (Lütken, 1874)                                  |   | N |                  |
| <i>Hypostomus vaillanti</i> (Steindachner, 1877)                       |   | N |                  |
| <i>Hypostomus velhochico</i> Zawadzki, Oyakawa & Britski, 2017         |   | N |                  |
| <i>Imparfinis borodini</i> Mees & Cala, 1989                           | N | N | 20/21/22/23      |
| <i>Imparfinis minutus</i> (Lütken, 1874)                               |   | N |                  |
| <i>Imparfinis mirini</i> Haseman, 1911                                 | N |   |                  |
| <i>Ituglanis bambui</i> Bichuette & Trajano, 2004 *                    | N |   | 14/107/127       |
| <i>Ituglanis boticário</i> Rizzato & Bichuette, 2015                   | N |   | 107/127          |
| <i>Ituglanis epikarsticus</i> Bichuette & Trajano, 2004 *              | N |   | 107/127          |
| <i>Ituglanis goya</i> Datovo, Aquino & Langeani, 2016                  | N |   | 127              |
| <i>Ituglanis ina</i> Wosiacki, Dutra & Mendonça, 2012                  | N |   | 127/128          |
| <i>Ituglanis macunaima</i> Datovo & Landim, 2005 *                     | N |   | 127/129          |
| <i>Ituglanis mambai</i> Bichuette & Trajano, 2008 *                    | N |   | 14/107/127/130   |

|                                                                               |   |   |         |
|-------------------------------------------------------------------------------|---|---|---------|
| <i>Ituglanis passensis</i> Fernández & Bichuette, 2002 *                      | N |   | 107/127 |
| <i>Ituglanis ramiroi</i> Bichuette & Trajano, 2004 *                          | N |   | 107/127 |
| <i>Lamontichthys avacanoeiro</i> de Carvalho Paixão & Toledo-Piza, 2009 *     | N |   | 14/131  |
| <i>Lamontichthys parakanade</i> Carvalho Paixão & Toledo-Piza, 2009 *         | N |   | 131     |
| <i>Leporacanthicus galaxias</i> Isbrücker & Nijssen, 1989                     | N |   | 1       |
| <i>Leptorhamdia essequibensis</i> (Eigenmann, 1912)                           | N |   |         |
| <i>Limatulichthys griséus</i> (Eigenmann, 1909)                               | N |   | 4       |
| <i>Lophiosilurus alexandri</i> Steindachner, 1876 *                           |   | N |         |
| <i>Loricaria lata</i> Eigenmann & Eigenmann, 1889                             | N |   |         |
| <i>Loricaria pumila</i> Thomas & Rapp Py-Daniel, 2008                         | N |   | 132     |
| <i>Loricaria cataphracta</i> Linnaeus, 1758                                   | N |   | 4       |
| <i>Loricariichthys nudirostris</i> (Kner, 1853)                               | N |   | 4       |
| <i>Megalancistrus barrae</i> (Steindachner, 1910)                             |   | N |         |
| <i>Megalodoras uranoscopus</i> (Eigenmann & Eigenmann, 1888)                  | N |   | 4       |
| <i>Microglanis leptostriatus</i> Mori & Shibatta, 2006                        |   | N |         |
| <i>Microglanis maculatus</i> Shibatta, 2014                                   | N |   | 133     |
| <i>Microglanis oliveirai</i> Ruiz & Shibatta, 2011                            | N |   | 134     |
| <i>Microglanis reikoe</i> Ruiz, 2016                                          |   | N |         |
| <i>Microglanis robustus</i> Ruiz & Shibatta, 2010 *                           | N |   |         |
| <i>Microglanis xerente</i> Ruiz, 2016                                         | N |   | 135     |
| <i>Microglanis xylographicus</i> Ruiz & Shibatta, 2011                        | N |   | 134     |
| <i>Micromyzon akamai</i> Friel & Lundberg, 1996                               | N |   |         |
| <i>Microlepidogaster discontenta</i> Calegari, Silva & Reis, 2014             |   | N |         |
| <i>Microlepidogaster negomata</i> Martins, Cherobim, Andrade & Langeani, 2017 |   | N |         |
| <i>Microplecostomus forestii</i> Silva, Roxo, Ochoa & Oliveira, 2016          | N |   | 136     |
| <i>Nannoplecostomus eleonora</i> Ribeira, Lima & Pereira, 2012                | N |   | 137     |
| <i>Neoplecostomus franciscoensis</i> Langeani, 1990                           |   | N |         |
| <i>Otocinclus hasemani</i> Steindachner, 1915                                 | N |   | 31      |
| <i>Otocinclus tapirape</i> Britto & Moreira, 2002                             | N |   | 51      |

|                                                                |   |   |                                |
|----------------------------------------------------------------|---|---|--------------------------------|
| <i>Otocinclus vittatus</i> Regan, 1904                         | N |   |                                |
| <i>Otocinclus xakriaba</i> Schaefer, 1997                      |   | N |                                |
| <i>Oxydoras niger</i> (Valenciennes, 1821)                     | N | N | 1/4/11/24/25/26/35/37/39       |
| <i>Panaque nigrolineatus</i> (Peters, 1877)                    | N |   | 1/4/7/24/35/37                 |
| <i>Parancistrus aurantiacus</i> (Castelnau, 1855) *            | N |   | 1/4                            |
| <i>Pareiorhina cepta</i> Roxo, Silva, Mehanna & Oliveira, 2012 |   | N |                                |
| <i>Pareiorhina rosai</i> Silva, Roxo & Oyakawa, 2016           |   | N |                                |
| <i>Parotocinclus prata</i> Ribeiro, Melo & Pereira, 2002       |   | N |                                |
| <i>Parotocinclus robustus</i> Lehmann & Reis, 2012             |   | N |                                |
| <i>Peckoltia oligospila</i> (Günther, 1864)                    | N |   |                                |
| <i>Phractocephalus hemiliopterus</i> (Bloch & Schneider, 1801) | N |   | 4/7                            |
| <i>Pimelodella laurenti</i> Fowler, 1941                       |   | N |                                |
| <i>Pimelodella spelaea</i> Trajano, Reis & Bichuette, 2004 *   | N |   | 14/138/139                     |
| <i>Pimelodella robinsoni</i> (Fowler, 1941)                    |   | N |                                |
| <i>Pimelodella vittata</i> (Lütken, 1874)                      |   | N |                                |
| <i>Pimelodina flavipinnis</i> Steindachner, 1876               | N |   | 1/4/12                         |
| <i>Pimelodus blochii</i> Valenciennes, 1840                    | N |   | 1/4/7/8/9/10/16/24/25/35/37/62 |
| <i>Pimelodus fur</i> (Lütken, 1874)                            |   | N |                                |
| <i>Pimelodus halisodous</i> Ribeiro, Lucena & Lucinda, 2008 *  | N |   | 140                            |
| <i>Pimelodus joannis</i> Ribeiro, Lucena & Lucinda, 2008 *     | N |   | 140                            |
| <i>Pimelodus luciae</i> Rocha & Ribeiro, 2010                  | N |   | 141                            |
| <i>Pimelodus maculatus</i> Lacepède, 1803                      |   | N |                                |
| <i>Pimelodus quadratus</i> Lucinda, Ribeiro & Lucena, 2016     | N |   |                                |
| <i>Pimelodus pohli</i> Ribeiro & Lucena, 2006                  |   | N |                                |
| <i>Pimelodus stewarti</i> Ribeiro, Lucena & Lucinda, 2008 *    | N |   | 140                            |
| <i>Pimelodus tetramerus</i> Ribeiro & Lucena, 2006             | N |   | 142                            |
| <i>Pirirampus pirinampu</i> (Spix & Agassiz, 1829)             | N |   | 1/4/8/9/10/11/25/35            |
| <i>Platydoras costatus</i> (Linnaeus, 1758)                    | N |   | 4/143                          |
| <i>Plesiopoma curvidens</i> Reis, Pereira & Lehmann, 2012 *    |   | N |                                |

|                                                                         |   |   |                                |
|-------------------------------------------------------------------------|---|---|--------------------------------|
| <i>Propimelodus araguayae</i> Rocha, de Oliveira & Rapp Py-Daniel, 2007 | N |   |                                |
| <i>Pseudacanthicus pitanga</i> Chamon, 2015                             | N |   |                                |
| <i>Pseudauchenipterus flavescens</i> (Eigenmann & Eigenmann, 1888)      |   | N |                                |
| <i>Pseudopimelodus charus</i> (Valenciennes, 1840)                      |   | N |                                |
| <i>Pseudoplatystoma corruscans</i> (Spix & Agassiz, 1829)               |   | N |                                |
| <i>Pseudoplatystoma fasciatum</i> (Linnaeus, 1766)                      | N |   | 4/7/9/10/24/25/26/37/44        |
| <i>Pseudotatia parva</i> Mees, 1974                                     |   | N |                                |
| <i>Pterodoras granulosus</i> (Valenciennes, 1821)                       | N |   | 1/25/35/44/144/145             |
| <i>Pterygoplichthys etentaculatus</i> (Spix & Agassiz, 1829)            |   | N |                                |
| <i>Pterygoplichthys joselimaianus</i> (Weber, 1991)                     | N |   | 4/12/100                       |
| <i>Rhamdia enfunada</i> Bichuette & Trajano, 2005                       |   | N |                                |
| <i>Rhamdia foina</i> (Müller & Troschel, 1849)                          | N |   |                                |
| <i>Rhamdia itacaiunas</i> Silfvergrip, 1996                             | N |   |                                |
| <i>Rhamdia poeyi</i> Eigenmann & Eigenmann, 1888                        | N |   |                                |
| <i>Rhamdia quelen</i> (Quoy & Gaimard, 1824)                            |   | N |                                |
| <i>Rhamdiopsis microcephala</i> (Lütken, 1874) *                        |   | N |                                |
| <i>Rhinelepis aspera</i> Spix & Agassiz, 1829 *                         |   | N |                                |
| <i>Rhinolekos capetinga</i> Roxo, Ochoa, Silva & Oliveira, 2015         | N |   | 146                            |
| <i>Rhynchodoras xingui</i> Klausewitz & Rössel, 1961 *                  | N |   |                                |
| <i>Rineloricaria hasemani</i> Isbrücker & Nijssen, 1979                 | N |   |                                |
| <i>Rineloricaria osvaldoi</i> Fichberg & Chamon, 2008                   | N |   | 147                            |
| <i>Scobinancistrus pariolispos</i> Isbrücker & Nijssen, 1989 *          | N |   | 4                              |
| <i>Scoloplax distolothrix</i> Schaefer, Weitzman & Britski, 1989        | N |   |                                |
| <i>Sorubim lima</i> (Bloch & Schneider, 1801)                           | N |   | 1/4/7/8/9/10/11/24/25/26/37/62 |
| <i>Spatuloricaria nudiventris</i> (Valenciennes, 1840)                  |   | N |                                |
| <i>Spectracanthicus javae</i> Chamon, Pereira, Mendonça & Akama, 2018   | N |   |                                |
| <i>Spectracanthicus tocantinensis</i> Chamon & Rapp Py-Daniel, 2014     | N |   | 148                            |
| <i>Squaliforma emarginata</i> (Valenciennes, 1840)                      | N |   | 1/9/10/22                      |
| <i>Stegophilus insidiosus</i> Reinhardt, 1859                           |   | N |                                |

|                                                               |   |   |                    |
|---------------------------------------------------------------|---|---|--------------------|
| <i>Sturisoma rostratum</i> (Spix & Agassiz, 1829)             | N |   | 4/9/10             |
| <i>Tatia intermedia</i> (Steindachner, 1877)                  | N |   | 55/149             |
| <i>Tocantinsia piresi</i> (Miranda Ribeiro, 1920) *           | N |   | 1                  |
| <i>Trachelyopterus leopardinus</i> (Borodin, 1927)            |   | N |                    |
| <i>Trichomycterus brasiliensis</i> Lütken, 1874               |   | N |                    |
| <i>Trichomycterus concolor</i> Costa, 1992                    |   | N |                    |
| <i>Trichomycterus macrotrichopterus</i> Barbosa & Costa, 2010 |   | N |                    |
| <i>Trichomycterus novalimensis</i> Barbosa & Costa, 2010 *    |   | N |                    |
| <i>Trichomycterus punctatissimus</i> Castelnau, 1855          | N |   |                    |
| <i>Trichomycterus reinhardti</i> (Eigenmann, 1917)            |   | N |                    |
| <i>Trichomycterus rubbioli</i> Bichuette & Rizzato, 2012 *    |   | N |                    |
| <i>Trichomycterus rubiginosus</i> Barbosa & Costa, 2010       |   | N |                    |
| <i>Tridentopsis tocantinsi</i> La Monte, 1939                 | N |   |                    |
| <i>Trichomycterus trefauti</i> Wosiacki, 2004                 |   | N |                    |
| <i>Trichomycterus variegatus</i> Costa, 1992                  |   | N |                    |
| <i>Typhlobelus macromycterus</i> Costa & Bockmann, 1994       | N |   |                    |
| <i>Xyliphius anachoretas</i> Figueiredo & Britto, 2010        | N |   | 150                |
| <i>Zungaro zungaro</i> (Humboldt, 1821)                       | N |   | 4/9/10/11/25/26/37 |
| <b>BATRACHOIDIFORMES</b>                                      |   |   |                    |
| <i>Potamobatrachus trispinosus</i> Collette, 1995 *           | N |   |                    |
| <b>CYPRINIFORMES</b>                                          |   |   |                    |
| <i>Ctenopharyngodon idella</i> (Valenciennes, 1844)           |   | I | 39/151             |
| <i>Cyprinus carpio</i> (Linnaeus, 1758)                       |   | I | 39/151             |
| <i>Hypophthalmichthys nobilis</i> (Richardson, 1845)          |   | I | 151                |
| <i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)       |   | I | 151                |
| <b>CYPRINODONTIFORMES</b>                                     |   |   |                    |
| <i>Anablepsoides tocantinenses</i> (Costa, 2010)              | N |   | 152                |
| <i>Cnesterodon septentrionalis</i> Rosa & Costa, 1993 *       | N |   |                    |
| <i>Cynolebias altus</i> Costa, 2001                           |   | N |                    |

|                                                                |   |   |     |
|----------------------------------------------------------------|---|---|-----|
| <i>Cynolebias attenuatus</i> Costa, 2001                       |   | N |     |
| <i>Cynolebias elegans</i> Costa, 2017                          |   | N |     |
| <i>Cynolebias gibbus</i> Costa, 2001                           |   | N |     |
| <i>Cynolebias gilbertoi</i> Costa, 1998                        |   | N |     |
| <i>Cynolebias gorutuba</i> Costa, 2017                         |   | N |     |
| <i>Cynolebias griseus</i> Costa, Lacerda & Brasil, 1990 *      | N |   | 14  |
| <i>Cynolebias leptocephalus</i> Costa & Brasil, 1993 *         |   | N |     |
| <i>Cynolebias obscurus</i> Costa, 2014                         |   | N |     |
| <i>Cynolebias ochraceus</i> Costa, 2014                        |   | N |     |
| <i>Cynolebias oticus</i> Costa, 2014                           |   | N |     |
| <i>Cynolebias parietalis</i> Costa, 2014                       |   | N |     |
| <i>Cynolebias perforatus</i> Costa & Brasil, 1991              |   | N |     |
| <i>Cynolebias porosus</i> Steindachner, 1876                   |   | N |     |
| <i>Cynolebias rectiventer</i> Costa, 2014                      |   | N |     |
| <i>Cynolebias roseus</i> Costa, 2014                           |   | N |     |
| <i>Hypsolebias adornatus</i> (Costa, 2000) *                   |   | N |     |
| <i>Hypsolebias alternatus</i> (Costa & Brasil, 1994) *         |   | N |     |
| <i>Hypsolebias auratus</i> (Costa & Nielsen, 2000) *           |   | N |     |
| <i>Hypsolebias brunoi</i> (Costa, 2003) *                      | N | N | 153 |
| <i>Hypsolebias carlettoi</i> (Costa & Nielsen, 2004) *         |   | N |     |
| <i>Hypsolebias delucai</i> (Costa, 2003)                       |   | N |     |
| <i>Hypsolebias faouri</i> Britzke, Nielsen & Oliveira, 2016    |   | N |     |
| <i>Hypsolebias fasciatus</i> (Costa & Brasil, 2006) *          |   | N |     |
| <i>Hypsolebias flammeus</i> (Costa, 1989) *                    | N |   | 153 |
| <i>Hypsolebias flavicaudatus</i> (Costa & Brasil, 1990) *      |   | N |     |
| <i>Hypsolebias fulminantis</i> (Costa & Brasil, 1993) *        |   | N |     |
| <i>Hypsolebias ghisolfii</i> (Costa, Cyrino & Nielsen, 1996) * |   | N |     |
| <i>Hypsolebias gibberatus</i> (Costa & Brasil, 2006) *         |   | N |     |
| <i>Hypsolebias gilbertobrasili</i> Costa, 2012 *               |   | N |     |

|                                                                                    |   |   |     |
|------------------------------------------------------------------------------------|---|---|-----|
| <i>Hypsolebias guanambi</i> Costa & Amorim, 2011 *                                 |   | N |     |
| <i>Hypsolebias harmonicus</i> (Costa, 2010) *                                      |   | N |     |
| <i>Hypsolebias hellneri</i> (Berkenkamp, 1993) *                                   |   | N |     |
| <i>Hypsolebias igneus</i> (Costa, 2000) *                                          |   | N |     |
| <i>Hypsolebias lopesi</i> (Nielsen, Shibatta, Suzart & Martín, 2010) *             |   | N |     |
| <i>Hypsolebias macaubensis</i> (Costa & Suzart, 2006) *                            |   | N |     |
| <i>Hypsolebias marginatus</i> (Costa & Brasil, 1996) *                             | N |   | 153 |
| <i>Hypsolebias mediopapillatus</i> (Costa, 2006) *                                 |   | N |     |
| <i>Hypsolebias multiradiatus</i> (Costa & Brasil, 1994) *                          | N |   | 153 |
| <i>Hypsolebias nielsenii</i> (Costa, 2005) *                                       |   | N |     |
| <i>Hypsolebias nitens</i> Costa, 2012                                              |   | N |     |
| <i>Hypsolebias notatus</i> (Costa, Lacerda & Brasil, 1990) *                       | N |   |     |
| <i>Hypsolebias picturatus</i> (Costa, 2000) *                                      |   | N |     |
| <i>Hypsolebias pterophyllus</i> Costa, 2012                                        |   | N |     |
| <i>Hypsolebias radiseriatus</i> Costa, 2012                                        |   | N |     |
| <i>Hypsolebias radiosus</i> (Costa & Brasil, 2004)                                 | N |   |     |
| <i>Hypsolebias rufus</i> (Costa, Nielsen & de Luca, 2001) *                        |   | N |     |
| <i>Hypsolebias sertanejo</i> Costa, 2012                                           |   | N |     |
| <i>Hypsolebias similis</i> (Costa & Hellner, 1999) *                               |   | N |     |
| <i>Hypsolebias stellatus</i> (Costa & Brasil, 1994) *                              |   | N |     |
| <i>Hypsolebias tocantinenses</i> Nielsen, Cruz & Junior, 2012 *                    | N |   | 153 |
| <i>Hypsolebias trifasciatus</i> Nielsen, Martins, de Araujo, de Lira & Faour, 2014 |   | N |     |
| <i>Hypsolebias trilineatus</i> (Costa & Brasil, 1994) *                            |   | N |     |
| <i>Hypsolebias virgulatus</i> (Costa & Brasil, 2006) *                             |   | N |     |
| <i>Maratecoara formosa</i> Costa & Brasil, 1995 *                                  | N |   |     |
| <i>Maratecoara lacortei</i> (Lazara, 1991)                                         | N |   |     |
| <i>Maratecoara splendida</i> Costa, 2007 *                                         | N |   |     |
| <i>Melanorivulus imperatrizensis</i> Nielsen & Pinto, 2015                         | N |   |     |
| <i>Melanorivulus crixas</i> (Costa, 2007) *                                        | N |   | 154 |

|                                                           |   |   |        |
|-----------------------------------------------------------|---|---|--------|
| <i>Melanorivulus ignescens</i> Costa, 2017                | N |   | 155    |
| <i>Melanorivulus jalapensis</i> (Costa, 2010)             | N |   | 156    |
| <i>Melanorivulus javahe</i> (Costa, 2007)                 | N |   | 154    |
| <i>Melanorivulus karaja</i> (Costa, 2007) *               | N |   | 154    |
| <i>Melanorivulus kayapo</i> (Costa, 2006) *               | N |   |        |
| <i>Melanorivulus kunzei</i> Costa, 2012 *                 | N |   |        |
| <i>Melanorivulus litteratus</i> (Costa, 2005) *           | N |   | 157    |
| <i>Melanorivulus paracatuensis</i> (Costa, 2003)          |   | N |        |
| <i>Melanorivulus petrisecundi</i> Costa, 2016             | N |   | 154    |
| <i>Melanorivulus pindorama</i> Costa, 2012 *              | N |   | 158    |
| <i>Melanorivulus planaltinus</i> (Costa & Brasil, 2008) * | N |   | 159    |
| <i>Melanorivulus rubromarginatus</i> (Costa, 2007) *      | N |   | 154    |
| <i>Melanorivulus salmonicaudus</i> (Costa, 2007) *        | N |   | 154    |
| <i>Melanorivulus spixi</i> Costa, 2016                    | N |   | 154    |
| <i>Melanorivulus ubirajarai</i> Costa, 2012 *             | N |   |        |
| <i>Melanorivulus violaceus</i> (Costa, 1991) *            | N |   |        |
| <i>Melanorivulus wallacei</i> Costa, 2016                 | N |   | 154    |
| <i>Melanorivulus zygonectes</i> (Myers, 1927)             | N |   | 13/154 |
| <i>Neofundulus acutirostratus</i> Costa, 1992             |   | N |        |
| <i>Pamphorichthys araguaiensis</i> Costa, 1991            | N |   | 1      |
| <i>Pamphorichthys pertapeh</i> Figueiredo, 2008 *         |   | N |        |
| <i>Phalloceros leticiae</i> Lucinda, 2008                 | N |   | 160    |
| <i>Phalloceros uai</i> Lucinda, 2008                      |   | N |        |
| <i>Pituna compacta</i> (Myers, 1927)                      | N |   | 161    |
| <i>Pituna obliquoseriata</i> Costa, 2007                  | N |   |        |
| <i>Pituna poranga</i> Costa, 1989                         | N |   |        |
| <i>Plesiolebias aruana</i> (Lazara, 1991)                 | N |   | 162    |
| <i>Plesiolebias canabravensis</i> Costa & Nielsen, 2007 * | N |   | 162    |
| <i>Plesiolebias filamentosus</i> Costa & Brasil, 2007     | N |   | 162    |

|                                                                      |   |   |                             |
|----------------------------------------------------------------------|---|---|-----------------------------|
| <i>Plesiolebias fragilis</i> Costa, 2007                             | N |   | 162                         |
| <i>Plesiolebias lacerdai</i> Costa, 1989                             | N |   | 162                         |
| <i>Plesiolebias xavantei</i> (Costa, Lacerda & Tanizaki, 1988) *     | N |   | 162                         |
| <i>Simpsonichthys choloptyryx</i> Costa, Moreira & Lima, 2003 *      | N |   |                             |
| <i>Simpsonichthys punctulatus</i> Costa & Brasil, 2007 *             |   | N |                             |
| <i>Simpsonichthys zonatus</i> (Costa & Brasil, 1990) *               |   | N |                             |
| <i>Spectrolebias costai</i> (Lazara, 1991)                           | N |   |                             |
| <i>Spectrolebias inaequipinnatus</i> (Costa & Brasil, 2008)          | N |   | 163                         |
| <i>Spectrolebias semiocellatus</i> Costa & Nielsen, 1997             | N |   |                             |
| <i>Trigonectes rubromarginatus</i> Costa, 1990                       | N |   | 4                           |
| <i>Trigonectes strigabundus</i> Myers, 1925 *                        | N |   |                             |
| <b>TETRAODONTIFORMES</b>                                             |   |   |                             |
| <i>Colomesus asellus</i> (Müller & Troschel, 1849)                   | N |   | 1/4/14/16                   |
| <i>Colomesus tocantinenses</i> Amaral, Brito, Silva & Carvalho, 2013 | N |   | 14                          |
| <b>OSTEOGLOSSIFORMES</b>                                             |   |   |                             |
| <i>Arapaima gigas</i> (Schinz, 1822) *                               | N |   | 164/165                     |
| <b>PERCIFORMES</b>                                                   |   |   |                             |
| <i>Acarichthys heckelii</i> (Müller & Troschel, 1849)                | N |   |                             |
| <i>Aequidens tetramerus</i> (Heckel, 1840)                           | N |   | 4/51                        |
| <i>Apistogramma tucurui</i> Staack, 2003                             | N |   |                             |
| <i>Astronotus ocellatus</i> (Agassiz, 1831)                          | N | I | 4/39/44/151                 |
| <i>Australoheros mattsos</i> Ottoni, 2012                            |   | N |                             |
| <i>Cichla kelberi</i> Kullander & Ferreira, 2006                     | N | I | 1/4/44/145/166/167          |
| <i>Cichla mirianae</i> Kullander & Ferreira, 2006                    | N |   | 166                         |
| <i>Cichla monoculus</i> Spix & Agassiz, 1831                         | N |   | 39/145/166                  |
| <i>Cichla ocellaris</i> Bloch & Schneider, 1801                      | N | I | 35/44/166                   |
| <i>Cichla pinima</i> Kullander & Ferreira, 2006                      | N |   | 166                         |
| <i>Cichla piquiti</i> Kullander & Ferreira, 2006                     | N | I | 1/4/9/10/44/145/166/167/168 |
| <i>Cichlasoma araguaiense</i> Kullander, 1983                        | N |   | 13/20/21/31                 |

|                                                                 |   |                                       |
|-----------------------------------------------------------------|---|---------------------------------------|
| <i>Cichlasoma sanctifranciscense</i> Kullander, 1983            | N | 13                                    |
| <i>Coptodon rendalli</i> (Boulenger, 1897)                      | I | 39                                    |
| <i>Crenicichla cametana</i> Steindachner, 1911                  | N |                                       |
| <i>Crenicichla compressiceps</i> Ploeg, 1986                    | N |                                       |
| <i>Crenicichla cyclostoma</i> Ploeg, 1986 *                     | N | 4                                     |
| <i>Crenicichla jegui</i> Ploeg, 1986 *                          | N | 4                                     |
| <i>Crenicichla labrina</i> (Spix & Agassiz, 1831)               | N | 1/4/31                                |
| <i>Crenicichla lugubris</i> Heckel, 1840                        | N | 1/9/10/11/26/62                       |
| <i>Crenicichla stocki</i> Ploeg, 1991                           | N |                                       |
| <i>Geophagus neambi</i> Lucinda, Lucena & Assis, 2010           | N | 169                                   |
| <i>Geophagus proximus</i> (Castelnau, 1855)                     | N | 167                                   |
| <i>Geophagus surinamensis</i> (Bloch, 1791)                     | N | 35                                    |
| <i>Geophagus sveni</i> Lucinda, Lucena & Assis, 2010            | N | 169                                   |
| <i>Laetacara araguaiae</i> Ottoni & Costa, 2009                 | N | 1/167                                 |
| <i>Mesonauta acora</i> (Castelnau, 1855)                        | N | 1/4                                   |
| <i>Microphilypnus ternetzi</i> Myers, 1927                      | N |                                       |
| <i>Oreochromis niloticus</i> (Linnaeus, 1758)                   | I | 39/151/170                            |
| <i>Pachyurus francisci</i> (Cuvier, 1830) *                     | N |                                       |
| <i>Pachyurus junki</i> Soares & Casatti, 2000                   | N | 4/12                                  |
| <i>Pachyurus paucirastrus</i> Aguilera, 1983 *                  | N | 1                                     |
| <i>Pachyurus schomburgkii</i> Günther, 1860                     | N | 1/35/171                              |
| <i>Plagioscion squamosissimus</i> (Heckel, 1840)                | N | 1/4/9/10/11/15/24/39/44/79/170        |
| <i>Retroculus acherontos</i> Landim, Moreira & Figueiredo, 2015 | N |                                       |
| <i>Retroculus lapidifer</i> (Castelnay, 1855)                   | N | 1/4/9/10/13/16/20/21/35/51/62/167/172 |
| <i>Rondonacara hoehnei</i> (Miranda Ribeiro, 1918)              | N |                                       |
| <i>Satanoperca acuticeps</i> (Heckel, 1840)                     | N | 4/51                                  |
| <i>Satanoperca jurupari</i> (Heckel, 1840)                      | N | 167                                   |
| <i>Teleocichla cinderella</i> Kullander, 1988 *                 | N |                                       |

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**Amphibians ANURA**

|                                                              |   |   |                     |
|--------------------------------------------------------------|---|---|---------------------|
| <i>Adelphobates galactonotus</i> (Steindachner, 1864)        | N |   | 1/2                 |
| <i>Adenomera bokermanni</i> (Heyer, 1973)                    |   | N | 3/4                 |
| <i>Adenomera hylaedactyla</i> (Cope, 1868)                   | N | N | 2/4/5/6/7           |
| <i>Adenomera martinezi</i> (Bokermann, 1956)                 | N |   |                     |
| <i>Allobates goianus</i> (Bokermann, 1975) *                 | N |   | 1/8/9               |
| <i>Ameerega flavopicta</i> (Lutz, 1925)                      | N | N | 1/3/4/5/8/9         |
| <i>Aplastodiscus arildae</i> (Cruz & Peixoto, 1987)          |   | N | 4/10                |
| <i>Aplastodiscus cavicola</i> (Cruz & Peixoto, 1985) *       |   | N | 4                   |
| <i>Barycholos ternetzi</i> (Miranda-Ribeiro, 1937)           | N | N | 2/4/5/6/8/9/11      |
| <i>Boana albopunctata</i> (Spix, 1824)                       | N | N | 1/3/4/5/6/7/8/10    |
| <i>Boana boans</i> (Linnaeus, 1758)                          | N |   | 1/4                 |
| <i>Boana botumirim</i> (Caramaschi, Cruz & Nascimento, 2009) |   | N | 4                   |
| <i>Boana buriti</i> (Caramaschi and Cruz, 1999)              |   | N | 4                   |
| <i>Boana cipoensis</i> (Lutz, 1968) *                        |   | N | 3/4                 |
| <i>Boana crepitans</i> (Wied-Neuwied, 1824)                  | N | N | 4/8/10/12           |
| <i>Boana faber</i> (Wied-Neuwied, 1821)                      |   | N | 3/4                 |
| <i>Boana geographica</i> (Spix, 1824)                        | N |   | 1/2                 |
| <i>Boana goiana</i> (Lutz, 1968)                             |   | N | 4                   |
| <i>Boana lundii</i> (Burmeister, 1856)                       | N | N | 1/3/4/5/6           |
| <i>Boana multifasciata</i> (Günther, 1859)                   | N |   | 1/2/4/5/8           |
| <i>Boana paranaiba</i> (Carvalho, Giaretta & Facure, 2010)   | N |   | 6                   |
| <i>Boana pardalis</i> (Spix, 1824)                           |   | N | 4                   |
| <i>Boana polytaenia</i> (Cope, 1870)                         |   | N | 4/10                |
| <i>Boana raniceps</i> (Cope, 1862)                           | N | N | 1/2/4/5/6/7/9/12/13 |
| <i>Boana wavrini</i> (Parker, 1936)                          | N |   | 2                   |
| <i>Bokermannohyla alvarengai</i> (Bokermann, 1956)           |   | N | 3/4                 |
| <i>Bokermannohyla circumdata</i> (Cope, 1871)                |   | N | 3/4/10              |

|                                                                        |   |   |                    |
|------------------------------------------------------------------------|---|---|--------------------|
| <i>Bokermannohyla diamantina</i> Napoli & Juncá, 2006                  |   | N | 4                  |
| <i>Bokermannohyla ibitiguara</i> (Cardoso, 1983)                       |   | N | 4                  |
| <i>Bokermannohyla martinsi</i> (Bokermann, 1964) *                     |   | N | 4                  |
| <i>Bokermannohyla nanuzae</i> (Bokermann and Sazima, 1973)             |   | N | 3/4                |
| <i>Bokermannohyla pseudopseudis</i> (Miranda-Ribeiro, 1937)            | N |   | 1                  |
| <i>Bokermannohyla ravida</i> (Caramaschi, Napoli, and Bernardes, 2001) |   | N | 4                  |
| <i>Bokermannohyla sagarana</i> Leite, Pezzuti & Drummond, 2011 *       |   | N | 4                  |
| <i>Bokermannohyla saxicola</i> (Bokermann, 1964)                       |   | N | 3/4                |
| <i>Bokermannohyla sazimai</i> (Cardoso and Andrade, 1982)              |   | N | 4                  |
| <i>Ceratophrys aurita</i> (Raddi, 1823) *                              |   | N | 4                  |
| <i>Ceratophrys joazeirensis</i> Mercadal de Barrio, 1986               |   | N | 4                  |
| <i>Chiasmocleis albopunctata</i> (Boettger, 1885)                      | N | N | 1/4/5/6/8/9        |
| <i>Corythomantis greeningi</i> Boulenger, 1896                         |   | N | 4/12               |
| <i>Crossodactylus trachystomus</i> (Reinhardt & Lütken, 1862)          |   | N | 4                  |
| <i>Dendropsophus anataliasiasi</i> (Bokermann, 1972)                   | N |   | 1                  |
| <i>Dendropsophus cruzi</i> (Pombal and Bastos, 1998)                   | N | N | 1/4/5/6/7/11       |
| <i>Dendropsophus decipiens</i> (Lutz, 1925)                            |   | N | 4                  |
| <i>Dendropsophus elegans</i> (Wied-Neuwied, 1824)                      |   | N | 3/4                |
| <i>Dendropsophus jimi</i> (Napoli & Caramaschi, 1999)                  |   | N | 4                  |
| <i>Dendropsophus leucophyllatus</i> (Beireis, 1783)                    | N |   | 1/2                |
| <i>Dendropsophus melanargyreus</i> (Cope, 1887)                        | N | N | 1/2/4/5/7/8        |
| <i>Dendropsophus microcephalus</i> (Cope, 1886)                        | N |   | 1/2/7/8/12         |
| <i>Dendropsophus minutus</i> (Peters, 1872)                            | N | N | 1/2/3/4/5/6/7/8/10 |
| <i>Dendropsophus nanus</i> (Boulenger, 1889)                           | N | N | 1/2/4/6            |
| <i>Dendropsophus rubicundulus</i> (Reinhardt & Lütken, 1862)           | N | N | 1/2/4/6/7          |
| <i>Dendropsophus soaresi</i> (Caramaschi & Jim, 1983) *                | N | N | 1/4/5/6/7/12/13    |
| <i>Dermatonotus muelleri</i> (Boettger, 1885)                          | N | N | 1/2/4/7/8/12/13    |

|                                                                    |   |   |                            |
|--------------------------------------------------------------------|---|---|----------------------------|
| <i>Elachistocleis cesarii</i> (Miranda-Ribeiro, 1920)              | N | N | 4/7/14                     |
| <i>Elachistocleis ovalis</i> (Schneider, 1799)                     | N |   | 1/2/3/5/8/9/10             |
| <i>Haddadus binotatus</i> (Spix, 1824)                             |   | N | 3/4                        |
| <i>Hylodes babax</i> Heyer, 1982                                   |   | N | 4                          |
| <i>Hylodes otavioi</i> Sazima & Bokermann, 1983                    |   | N | 3/4                        |
| <i>Ischnocnema izecksohni</i> (Caramaschi & Kisteumacher, 1989)    |   | N | 4                          |
| <i>Ischnocnema juipoca</i> (Sazima & Cardoso, 1978)                |   | N | 3/4/10                     |
| <i>Ischnocnema surda</i> Canedo, Pimenta, Leite & Caramaschi, 2010 |   | N | 4                          |
| <i>Itapotihyla langsdorffii</i> (Duméril & Bibron, 1841)           |   | N | 4                          |
| <i>Julianus pinimus</i> (Bokermann & Sazima, 1973)                 |   | N | 4                          |
| <i>Leptodactylus caatingae</i> Heyer & Juncá, 2003                 |   | N | 4                          |
| <i>Leptodactylus camaquara</i> Sazima & Bokermann, 1978            |   | N | 3/4                        |
| <i>Leptodactylus chaquensis</i> Ceil, 1950                         |   | N | 4                          |
| <i>Leptodactylus cunicularius</i> Sazima & Bokermann, 1978         |   | N | 4/10                       |
| <i>Leptodactylus furnarius</i> Sazima & Bokermann, 1978            | N | N | 1/3/4/6/8                  |
| <i>Leptodactylus fuscus</i> (Schneider, 1799)                      | N | N | 1/2/3/4/5/6/7/9/12/13      |
| <i>Leptodactylus jolyi</i> Sazima & Bokermann, 1978                |   | N | 3/4                        |
| <i>Leptodactylus labyrinthicus</i> (Spix, 1824)                    | N | N | 1/2/3/4/5/6/7/8/9/12/13    |
| <i>Leptodactylus latrans</i> (Steffen, 1815)                       | N | N | 1/2/3/4/5/6/7/8/9/10/12/13 |
| <i>Leptodactylus mystaceus</i> (Spix, 1824)                        | N | N | 1/2/4/5/6/8/9              |
| <i>Leptodactylus mystacinus</i> (Burmeister, 1861)                 | N | N | 1/4/5/6/8/9                |
| <i>Leptodactylus petersii</i> (Steindachner, 1864)                 | N |   | 1/8/9                      |
| <i>Leptodactylus podicipinus</i> (Cope, 1862)                      | N | N | 1/2/4/5/6/8                |
| <i>Leptodactylus pustulatus</i> (Peters, 1870)                     | N |   | 1                          |
| <i>Leptodactylus sertanejo</i> Giaretta & Costa, 2007              | N |   | 7/11                       |
| <i>Leptodactylus syphax</i> Bokermann, 1969                        | N | N | 1/4/5/6/7/8/9/12/13        |
| <i>Leptodactylus troglodytes</i> Lutz, 1926                        | N | N | 1/2/4/7/12/13              |

|                                                                           |   |   |                       |
|---------------------------------------------------------------------------|---|---|-----------------------|
| <i>Leptodactylus vastus</i> Lutz, 1930                                    | N |   | 2                     |
| <i>Lithobates catesbeianus</i> (Shaw, 1802)                               | I |   | 14                    |
| <i>Lithobates palmipes</i> (Spix, 1824)                                   | N |   | 1/15                  |
| <i>Lithodytes lineatus</i> (Schneider, 1799)                              | N |   | 1                     |
| <i>Odontophrynus americanus</i> (Duméril & Bibron, 1841)                  |   | N | 3/4/10                |
| <i>Odontophrynus carvalhoi</i> Savage & Cei, 1965                         |   | N | 4                     |
| <i>Odontophrynus cultripes</i> Reinhardt & Lütken, 1862                   | N | N | 1/4                   |
| <i>Ololygon canastrensis</i> (Cardoso & Haddad, 1982)                     |   | N | 4                     |
| <i>Ololygon flavoguttata</i> (Lutz & Lutz, 1939)                          |   | N | 4/10                  |
| <i>Ololygon longilinea</i> (Lutz, 1968)                                   |   | N | 4                     |
| <i>Ololygon luizotavioi</i> Caramaschi & Kisteumacher, 1989               |   | N | 4/10                  |
| <i>Ololygon machadoi</i> (Bokermann & Sazima, 1973)                       |   | N | 3/4                   |
| <i>Ololygon skaios</i> (Pombal, Carvalho, Canelas & Bastos, 2010)         |   | N | 4                     |
| <i>Oreobates remotus</i> Teixeira, Amaro, Recoder, Sena & Rodrigues, 2012 |   | N | 4                     |
| <i>Phasmahyla jandaia</i> (Bokermann & Sazima, 1978) *                    |   | N | 3/4                   |
| <i>Phyllomedusa burmeisteri</i> Boulenger, 1882                           |   | N | 4                     |
| <i>Physalaemus albifrons</i> (Spix, 1824)                                 |   | N | 4                     |
| <i>Physalaemus centralis</i> Bokermann, 1962 *                            | N | N | 1/2/4/6/7/8/9/12/13   |
| <i>Physalaemus cicada</i> Bokermann, 1966                                 |   | N | 4                     |
| <i>Physalaemus crombiei</i> Heyer & Wolf, 1989                            |   | N | 4                     |
| <i>Physalaemus cuvieri</i> Fitzinger, 1826                                | N | N | 1/2/3/4/5/6/7/9/10/13 |
| <i>Physalaemus deimaticus</i> Sazima & Caramaschi, 1988 *                 |   | N | 3/4                   |
| <i>Physalaemus evangelistai</i> Bokermann, 1967                           |   | N | 3/4                   |
| <i>Physalaemus kroeyeri</i> (Reinhardt & Lütken, 1862)                    |   | N | 4                     |
| <i>Physalaemus marmoratus</i> (Reinhardt & Lütken, 1862)                  |   | N | 4                     |
| <i>Physalaemus maximus</i> Feio, Pombal & Caramaschi, 1999 *              |   | N | 4                     |
| <i>Physalaemus nattereri</i> (Steindachner, 1863)                         | N | N | 1/2/4/6/7/8/9/11      |

|                                                                                                           |   |   |                       |
|-----------------------------------------------------------------------------------------------------------|---|---|-----------------------|
| <i>Pithecopus ayeaye</i> Lutz, 1966 *                                                                     |   | N | 4                     |
| <i>Pithecopus azureus</i> (Cope, 1862)                                                                    | N |   | 1/5/6/7               |
| <i>Pithecopus hypochondrialis</i> (Daudin, 1800)                                                          | N |   | 2/8/13                |
| <i>Pithecopus megacephalus</i> (Miranda-Ribeiro, 1926)                                                    |   | N | 3/4                   |
| <i>Pithecopus nordestinus</i> (Caramaschi, 2006)                                                          |   | N | 4                     |
| <i>Pithecopus oreades</i> (Brandão, 2002)                                                                 |   | N | 4                     |
| <i>Pleurodema diplolister</i> (Peters, 1870)                                                              | N | N | 1/4/7/12/13           |
| <i>Pristimantis fenestratus</i> (Steindachner, 1864)                                                      | N |   | 1/2                   |
| <i>Proceratophrys bagnoi</i> Brandão, Caramaschi, Vaz-Silva & Campos, 2013                                | N |   | 6                     |
| <i>Proceratophrys boiei</i> (Wied-Neuwied, 1824)                                                          |   | N | 4                     |
| <i>Proceratophrys concavumpanum</i> Giaretta, Bernarde & Kokubum, 2000                                    | N |   | 1                     |
| <i>Proceratophrys cristicaps</i> (Müller, 1883)                                                           | N |   | 1/5/9/13              |
| <i>Proceratophrys cururu</i> Eterovick & Sazima, 1998                                                     |   | N | 3/4                   |
| <i>Proceratophrys goyana</i> (Miranda-Ribeiro, 1937)                                                      | N | N | 1/4/5/7/8/9/11        |
| <i>Proceratophrys vielliardi</i> Martins & Giaretta, 2011                                                 |   | N | 4                     |
| <i>Proceratophrys carranca</i> Godinho, Moura, Lacerda & Feio, 2013                                       |   | N | 4                     |
| <i>Pseudis bolbodactyla</i> Lutz, 1925                                                                    | N | N | 1/4/6                 |
| <i>Pseudis tocanins</i> Caramaschi & Cruz, 1998                                                           | N |   | 1/2                   |
| <i>Pseudopaludicola giarettai</i> Carvalho, 2012                                                          |   | N | 4                     |
| <i>Pseudopaludicola mineira</i> Lobo, 1994                                                                |   | N | 3/4                   |
| <i>Pseudopaludicola murundu</i> Toledo, Siqueira, Duarte, Veiga-Menoncello, Recco-Pimentel & Haddad, 2010 |   | N | 4                     |
| <i>Pseudopaludicola mystacalis</i> (Cope, 1887)                                                           | N | N | 1/2/4/7               |
| <i>Pseudopaludicola saltica</i> (Cope, 1887)                                                              | N | N | 1/3/4/7/8             |
| <i>Pseudopaludicola ternetzi</i> Miranda-Ribeiro, 1937                                                    |   | N | 4                     |
| <i>Rhaebo guttatus</i> (Schneider, 1799)                                                                  | N |   | 1/7/8                 |
| <i>Rhinella crucifer</i> (Wied-Neuwied, 1821)                                                             |   | N | 4                     |
| <i>Rhinella granulosa</i> (Spix, 1824)                                                                    | N | N | 1/2/4/5/6/7/8/9/12/13 |

|                                                                              |   |   |                            |
|------------------------------------------------------------------------------|---|---|----------------------------|
| <i>Rhinella inopina</i> Vaz-Silva, Valdujo & Pombal, 2012                    |   | N | 4                          |
| <i>Rhinella margaritifera</i> (Laurenti, 1768)                               | N |   | 1/2/5                      |
| <i>Rhinella mirandaribeiroi</i> (Gallardo, 1965)                             | N | N | 4/6/7                      |
| <i>Rhinella ocellata</i> (Günther, 1858)                                     | N |   | 1/5/7/8/9                  |
| <i>Rhinella rubescens</i> (Lutz, 1925)                                       |   | N | 3/4/10                     |
| <i>Rhinella schneideri</i> (Werner, 1894)                                    | N | N | 1/2/3/4/5/6/7/8/9/10/12/13 |
| <i>Rhinella veredas</i> (Brandão, Maciel & Sebben, 2007)                     |   | N | 4                          |
| <i>Scinax cabralensis</i> Drummond, Baêta & Pires, 2007                      |   | N | 4                          |
| <i>Scinax camposseabrai</i> (Bokermann, 1968)                                |   | N | 4                          |
| <i>Scinax constrictus</i> Lima, Bastos & Giaretta, 2005                      | N |   | 6/7                        |
| <i>Scinax curicica</i> Pugliese, Pombal & Sazima, 2004                       |   | N | 4                          |
| <i>Scinax fuscomarginatus</i> (Lutz, 1925)                                   | N | N | 1/2/4/5/6/7                |
| <i>Scinax fuscovarius</i> (Lutz, 1925)                                       | N | N | 1/2/3/4/5/6/7/8/9/10/12/13 |
| <i>Scinax maracaya</i> (Cardoso & Sazima, 1980)                              |   | N | 4                          |
| <i>Scinax nebulosus</i> (Spix, 1824)                                         | N |   | 1/2                        |
| <i>Scinax pachycrus</i> (Miranda-Ribeiro, 1937)                              |   | N | 4/12                       |
| <i>Scinax rogerioi</i> Pugliese, Baêta & Pombal, 2009                        |   | N | 4                          |
| <i>Scinax similis</i> (Cochran, 1952)                                        |   | N | 4                          |
| <i>Scinax squalirostris</i> (Lutz, 1925)                                     |   | N | 3/4/10                     |
| <i>Scinax tigrinus</i> Nunes, Carvalho & Pereira, 2010                       |   | N | 4                          |
| <i>Scinax x-signatus</i> (Spix, 1824)                                        | N | N | 2/4/8/12/13                |
| <i>Thoropa megatympanum</i> Caramaschi & Sazima, 1984                        |   | N | 3/4                        |
| <i>Trachycephalus mambaiensis</i> Cintra, Silva, Silva, Garcia & Zaher, 2009 |   | N | 4                          |
| <i>Trachycephalus nigromaculatus</i> Tschudi, 1838                           |   | N | 4                          |
| <i>Trachycephalus typhonius</i> (Linnaeus, 1758)                             | N | N | 1/2/3/4/5/6/7              |
| <i>Vitreorana eurygnatha</i> (Lutz, 1925)                                    |   | N | 4/10                       |
| <i>Vitreorana franciscana</i> Santana, Barros, Pontes & Feio, 2015           |   | N | 4                          |

**GYMNOPHIONA***Caecilia gracilis* Shaw, 1802

N

2

*Siphonops paulensis* Boettger, 1892

N

1/2/13/12/16

**Reptiles****TESTUDINES***Acanthochelys radiolata* (Mikan, 1820)

N

1/2/3/4

*Acanthochelys spixii* (Duméril & Bibron, 1835)

N

N

1/2/3/4

*Chelus fimbriata* (Schneider, 1783)

N

1/2/3/4

*Hydromedusa tectifera* Cope, 1870a

N

1/2/3/4

*Kinosternon scorpioides scorpioides* (Linnaeus, 1766)

N

N

1/2/3/4

*Mesoclemmys perplexa* Bour & Zaher, 2005

N

1/2/3/4

*Mesoclemmys tuberculata* (Luederwaldt, 1926)

N

1/2/3/4

*Mesoclemmys vanderhaegei* (Bour, 1973)

N

N

1/2/3/4

*Phrynops geoffroanus* (Schweigger, 1812)

N

N

1/2/3/4

*Podocnemis expansa* (Schweigger, 1812) \*

N

1/2/3/4

*Podocnemis unifilis* Troschel, 1848 \*

N

1/2/3/4

*Rhinoclemmys punctularia* (Daudin, 1801)

N

1/2/3/4

*Trachemys dorbigni* (Duméril & Bibron, 1835)

I

I

1/2/3/4

**CROCODYLIA***Caiman crocodilus crocodilos* (Linnaeus, 1758)

N

N

2/3/4/5

*Caiman latirostris* (Daudin, 1801)

N

N

2/3/4/5

*Melanosuchus niger* (Spix, 1825)

N

2/3/4/5

*Paleosuchus palpebrosus* (Cuvier, 1807)

N

N

2/3/4/5

**SQUAMATA***Eunectes murinus* (Linnaeus, 1758)

N

N

2/3/4/6

*Eunectes notaeus* Cope, 1862

N

2/3/4/6

*Helicops angulatus* (Linnaeus, 1758)

N

N

2/3/4/6

*Helicops apiaka* Kawashita-Ribeiro, Ávila & Morais, 2013

N

2/3/4/6

|                        |                                                                     |   |   |               |
|------------------------|---------------------------------------------------------------------|---|---|---------------|
|                        | <i>Helicops hagmanni</i> Roux, 1910                                 | N |   | 2/3/4/6       |
|                        | <i>Helicops leopardinus</i> (Schlegel, 1837)                        |   | N | 2/3/4/6       |
|                        | <i>Helicops modestus</i> Günther, 1861                              | N | N | 2/3/4/6       |
|                        | <i>Helicops polylepis</i> Günther, 1861                             | N |   | 2/3/4/6       |
|                        | <i>Helicops tapajonicus</i> Frota, 2005                             | N |   | 2/3/4/6       |
|                        | <i>Helicops trivittatus</i> (Gray, 1849)                            | N |   | 2/3/4/6       |
|                        | <i>Hydrodynastes bicinctus</i> (Herrmann, 1804)                     | N |   | 2/3/4/6       |
|                        | <i>Hydrodynastes gigas</i> (Duméril, Bibron & Duméril, 1854)        | N |   | 2/3/4/6       |
|                        | <i>Hydrodynastes melanogigas</i> Franco, Fernandes & Bentin, 2007 * | N |   | 2/3/4/6       |
|                        | <i>Hydrops martii</i> (Wagler in Spix, 1824)                        | N |   | 2/3/4/6       |
|                        | <i>Micrurus lemniscatus</i> (Linnaeus, 1758)                        | N | N | 2/3/4/6       |
|                        | <i>Pseudoeryx plicatilis</i> (Linnaeus, 1758)                       | N | N | 2/3/4/6       |
|                        | <i>Xenodon rabdocephalus rabdocephalus</i> (Wied-Neuwied, 1824)     | N | N | 2/3/4/6       |
| <b>Aquatic Mammals</b> | <b>ARTIODACTYLA</b>                                                 |   |   |               |
|                        | <b>Infraorder Cetacea</b>                                           |   |   |               |
|                        | <i>Inia araguaiaensis</i> Hrbek, Da Silva, Dutra, Farias, 2014 *    | N |   | 1/2/3         |
|                        | <i>Sotalia fluviatilis</i> (Gervais & Deville, 1853) *              | N |   | 4             |
|                        | <b>CARNIVORA</b>                                                    |   |   |               |
|                        | <i>Pteronura brasiliensis</i> (Gmelin, 1788) *                      | N |   | 5             |
|                        | <i>Lontra longicaudis</i> (Olfers, 1818) *                          | N | N | 5             |
| <b>Aquatic Plants</b>  | <b>ALISMATALES</b>                                                  |   |   |               |
|                        | <b>Alismataceae</b>                                                 |   |   |               |
|                        | <i>Echinodorus</i>                                                  | N | N | 1/2/3/4/5/6/7 |
|                        | <i>Hydrocleys</i>                                                   |   | N | 2/3/4/5/6/7   |
|                        | <i>Limnocharis</i>                                                  | N | N | 1/2           |
|                        | <i>Sagittaria</i>                                                   | N | N | 1/4/8         |

**Asclepiadaceae**

|          |  |   |     |
|----------|--|---|-----|
| Roulinia |  | N | 2/3 |
|----------|--|---|-----|

**Araceae**

|       |   |   |       |
|-------|---|---|-------|
| Lemna | N | N | 4/6/7 |
|-------|---|---|-------|

|               |  |   |     |
|---------------|--|---|-----|
| Montrichardia |  | N | 6/7 |
|---------------|--|---|-----|

|        |   |   |               |
|--------|---|---|---------------|
| Pistia | N | N | 1/2/3/4/5/6/7 |
|--------|---|---|---------------|

|           |   |  |   |
|-----------|---|--|---|
| Urospatha | N |  | 1 |
|-----------|---|--|---|

|         |  |   |     |
|---------|--|---|-----|
| Wolffia |  | N | 2/3 |
|---------|--|---|-----|

|             |  |   |     |
|-------------|--|---|-----|
| Wolffxiella |  | N | 4/6 |
|-------------|--|---|-----|

|            |   |  |   |
|------------|---|--|---|
| Xanthosoma | N |  | 1 |
|------------|---|--|---|

**Hydrocharitaceae**

|           |   |  |   |
|-----------|---|--|---|
| Apalanthe | N |  | 1 |
|-----------|---|--|---|

|        |  |   |             |
|--------|--|---|-------------|
| Egeria |  | N | 2/3/4/5/7/8 |
|--------|--|---|-------------|

|       |   |   |           |
|-------|---|---|-----------|
| Najas | N | N | 1/2/4/7/9 |
|-------|---|---|-----------|

|            |  |   |   |
|------------|--|---|---|
| Valisneria |  | N | 2 |
|------------|--|---|---|

**Potamogetonaceae**

|             |  |   |     |
|-------------|--|---|-----|
| Potamogeton |  | N | 4/8 |
|-------------|--|---|-----|

**ASPARAGALES****Amaryllidaceae**

|        |  |   |   |
|--------|--|---|---|
| Crinum |  | N | 6 |
|--------|--|---|---|

**APIALES****Araliaceae**

|             |   |  |   |
|-------------|---|--|---|
| Hydrocotyle | N |  | 7 |
|-------------|---|--|---|

**ARECALES****Arecaceae**

|            |  |   |   |
|------------|--|---|---|
| Copernicia |  | N | 6 |
|------------|--|---|---|

|         |  |   |   |
|---------|--|---|---|
| Euterpe |  | N | 6 |
|---------|--|---|---|

|                       |   |   |               |
|-----------------------|---|---|---------------|
| Mikania               |   | N | 4/5/6/7/8     |
| <b>ASTERALES</b>      |   |   |               |
| <b>Asteraceae</b>     |   |   |               |
| Eclipta               | N | N | 1/4/5/7       |
| Egletes               |   | N | 4/8           |
| Enydra                |   | N | 4/6/7/8       |
| Lepidaploa            |   | N | 4/5/8         |
| Pluchea               |   | N | 4/7/8         |
| <b>Menyanthaceae</b>  |   |   |               |
| Nymphoides            | N | N | 1/2/4/5/6/7/8 |
| <b>BORAGINALES</b>    |   |   |               |
| <b>Boraginaceae</b>   |   |   |               |
| Euploca               |   | N | 4/5/7/8       |
| Heliotropium          |   | N | 4/5/7/8       |
| <b>BRASSICALES</b>    |   |   |               |
| <b>Capparaceae</b>    |   |   |               |
| Tarenaya              |   | N | 2/4/5/6/7/8   |
| <b>Cleomaceae</b>     |   |   |               |
| Cleome                |   | N | 3             |
| <b>CARYOPHYLLALES</b> |   |   |               |
| <b>Aizoaceae</b>      |   |   |               |
| Sesuvium              |   | N | 4/8           |
| <b>Amaranthaceae</b>  |   |   |               |
| Alternanthera         |   | N | 2/4/8         |
| Amaranthus            |   | N | 4/7/8         |
| Chenopodium           |   | N | 4/5           |
| Dysphania             |   | N | 8             |

**Droseraceae**

|         |  |   |   |
|---------|--|---|---|
| Drosera |  | N | 6 |
|---------|--|---|---|

**Molluginaceae**

|        |  |   |       |
|--------|--|---|-------|
| Glinus |  | N | 4/5/8 |
|--------|--|---|-------|

|         |  |   |       |
|---------|--|---|-------|
| Mollugo |  | N | 4/7/8 |
|---------|--|---|-------|

**Polygonaceae**

|           |   |   |               |
|-----------|---|---|---------------|
| Polygonum | N | N | 1/2/3/4/5/7/8 |
|-----------|---|---|---------------|

**CHARALES****Characeae**

|       |   |   |         |
|-------|---|---|---------|
| Chara | N | N | 1/2/4/5 |
|-------|---|---|---------|

**COMMELINALES****Commelinaceae**

|          |  |   |       |
|----------|--|---|-------|
| Callisia |  | N | 4/7/8 |
|----------|--|---|-------|

|           |   |   |       |
|-----------|---|---|-------|
| Commelina | N | N | 1/2/7 |
|-----------|---|---|-------|

|             |  |   |     |
|-------------|--|---|-----|
| Tripogandra |  | N | 4/5 |
|-------------|--|---|-----|

**Pontederiaceae**

|            |   |   |                   |
|------------|---|---|-------------------|
| Eichhornia | N | N | 1/2/3/4/5/6/7/8/9 |
|------------|---|---|-------------------|

|              |   |   |             |
|--------------|---|---|-------------|
| Heteranthera | N | N | 1/4/5/6/7/8 |
|--------------|---|---|-------------|

|            |  |   |     |
|------------|--|---|-----|
| Hydrothrix |  | N | 4/8 |
|------------|--|---|-----|

|            |   |   |       |
|------------|---|---|-------|
| Pontederia | N | N | 1/6/9 |
|------------|---|---|-------|

**CURCUBITALES****Cucurbitaceae**

|         |  |   |       |
|---------|--|---|-------|
| Cucumis |  | N | 2/3/4 |
|---------|--|---|-------|

|        |  |   |     |
|--------|--|---|-----|
| Luffia |  | N | 4/8 |
|--------|--|---|-----|

**FABALES****Fabaceae**

|              |  |   |     |
|--------------|--|---|-----|
| Aeschynomene |  | N | 2/4 |
|--------------|--|---|-----|

|                     |   |           |
|---------------------|---|-----------|
| Indigofera          | N | 4/8       |
| Lonchocarpus        | N | 6         |
| Machaerium          | N | 6         |
| Macroptilium        | N | 4/6/7     |
| Mimosa              | N | 4/6/7/8   |
| Mucuna              | N | 6         |
| Neptunia            | N | 4/5/6/7/8 |
| Tephrosia           | N | 4/5/8     |
| Vachellia           | N | 4/5       |
| <b>Leguminosae</b>  |   |           |
| Sesbania            | N | 4/8       |
| <b>Polygalaceae</b> |   |           |
| Asemeia             | N | 8         |
| <b>GENTIANALES</b>  |   |           |
| <b>Apocynaceae</b>  |   |           |
| Funastrum           | N | 6         |
| <b>Gentianaceae</b> |   |           |
| Schultesia          | N | 4/5/6/7/8 |
| <b>Rubiaceae</b>    |   |           |
| Borreria            | N | 6/7       |
| Diodella            | N | 4/6/7/8   |
| Genipa              | N | 6         |
| Machaonia           | N | 6         |
| Mitracarpus         | N | 4/8       |
| <b>LAMIALES</b>     |   |           |
| <b>Acanthaceae</b>  |   |           |
| Avicennia           | N | 6         |

**Bignoniaceae**

|          |  |   |   |
|----------|--|---|---|
| Bignonia |  | N | 6 |
|----------|--|---|---|

**Lamiaceae**

|              |  |   |     |
|--------------|--|---|-----|
| Mesosphaerum |  | N | 7/8 |
|--------------|--|---|-----|

**Lentibulariaceae**

|             |   |   |             |
|-------------|---|---|-------------|
| Utricularia | N | N | 1/2/3/4/6/7 |
|-------------|---|---|-------------|

**Plantaginaceae**

|          |  |   |     |
|----------|--|---|-----|
| Anamaria |  | N | 4/8 |
|----------|--|---|-----|

|           |  |   |         |
|-----------|--|---|---------|
| Angelonia |  | N | 4/5/7/8 |
|-----------|--|---|---------|

|        |   |   |                 |
|--------|---|---|-----------------|
| Bacopa | N | N | 1/2/3/4/5/6/7/8 |
|--------|---|---|-----------------|

|          |  |   |         |
|----------|--|---|---------|
| Scoparia |  | N | 4/5/7/8 |
|----------|--|---|---------|

|          |  |   |         |
|----------|--|---|---------|
| Stemodia |  | N | 4/5/7/8 |
|----------|--|---|---------|

**Verbenaceae**

|                |  |   |       |
|----------------|--|---|-------|
| Stachytarpheta |  | N | 4/7/8 |
|----------------|--|---|-------|

**MALPIGHIALES****Euphorbiaceae**

|           |  |   |     |
|-----------|--|---|-----|
| Bernardia |  | N | 4/8 |
|-----------|--|---|-----|

|        |  |   |         |
|--------|--|---|---------|
| Croton |  | N | 2/3/7/8 |
|--------|--|---|---------|

|           |  |   |         |
|-----------|--|---|---------|
| Euphorbia |  | N | 4/5/7/8 |
|-----------|--|---|---------|

**Rhizophoraceae**

|            |  |   |   |
|------------|--|---|---|
| Rhizophora |  | N | 6 |
|------------|--|---|---|

**MALVALES****Malvaceae**

|          |  |   |   |
|----------|--|---|---|
| Hibiscus |  | N | 6 |
|----------|--|---|---|

|          |  |   |     |
|----------|--|---|-----|
| Melochia |  | N | 2/3 |
|----------|--|---|-----|

|         |  |   |     |
|---------|--|---|-----|
| Peltaea |  | N | 6/7 |
|---------|--|---|-----|

|            |  |   |   |
|------------|--|---|---|
| Talipariti |  | N | 6 |
|------------|--|---|---|

**MARCHANTIALES****Ricciaceae**

|              |  |   |       |
|--------------|--|---|-------|
| Ricciocarpus |  | N | 2/3/4 |
|--------------|--|---|-------|

**MYRTALES****Combretaceae**

|           |  |   |   |
|-----------|--|---|---|
| Combretum |  | N | 6 |
|-----------|--|---|---|

|            |  |   |   |
|------------|--|---|---|
| Conocarpus |  | N | 6 |
|------------|--|---|---|

|              |  |   |   |
|--------------|--|---|---|
| Laguncularia |  | N | 6 |
|--------------|--|---|---|

**Lythraceae**

|          |  |   |       |
|----------|--|---|-------|
| Ammannia |  | N | 4/7/8 |
|----------|--|---|-------|

|             |  |   |       |
|-------------|--|---|-------|
| Pleurophora |  | N | 4/7/8 |
|-------------|--|---|-------|

|        |  |   |     |
|--------|--|---|-----|
| Rotala |  | N | 2/7 |
|--------|--|---|-----|

**Onagraceae**

|        |  |   |   |
|--------|--|---|---|
| Crenea |  | N | 6 |
|--------|--|---|---|

|          |   |   |                   |
|----------|---|---|-------------------|
| Ludwigia | N | N | 1/2/3/4/5/6/7/8/9 |
|----------|---|---|-------------------|

**NYMPHAEALES****Cabombaceae**

|         |   |   |           |
|---------|---|---|-----------|
| Cabomba | N | N | 1/2/3/4/7 |
|---------|---|---|-----------|

**Nymphaeaceae**

|        |  |   |   |
|--------|--|---|---|
| Nuphar |  | N | 2 |
|--------|--|---|---|

|          |  |   |               |
|----------|--|---|---------------|
| Nymphaea |  | N | 2/3/4/5/6/7/8 |
|----------|--|---|---------------|

**POALES****Cyperaceae**

|             |   |  |   |
|-------------|---|--|---|
| Bulbostyles | N |  | 1 |
|-------------|---|--|---|

|             |  |   |       |
|-------------|--|---|-------|
| Bulbostylis |  | N | 4/7/8 |
|-------------|--|---|-------|

|         |   |   |               |
|---------|---|---|---------------|
| Cyperus | N | N | 1/2/3/4/5/7/8 |
|---------|---|---|---------------|

|            |   |   |                 |
|------------|---|---|-----------------|
| Eleocharis | N | N | 1/2/3/4/5/7/8/9 |
|------------|---|---|-----------------|

|                         |   |   |                 |
|-------------------------|---|---|-----------------|
| Fimbristylis            |   | N | 4/7/8           |
| Fuirema                 | N |   | 1/4/7           |
| Oxycaryum               | N | N | 1/2/3/4/5/7/9   |
| Rhynchospora            | N | N | 1/4/7/8         |
| <b>Poaceae</b>          |   |   |                 |
| Brachiaria              | I |   | 9               |
| Echinochloa             |   | N | 4/7/8           |
| Eleusine                |   | N | 6               |
| Eragrostis              |   | N | 4/5/6/7/8       |
| Hymenachne              |   | N | 2/3/4/5/7/8     |
| Luziola                 |   | N | 4/5/7/8         |
| Megathyrsus             |   | N | 6/7             |
| Panicum                 |   | N | 7/8             |
| Paspalum                | N | N | 1/2/3/4/6/7/9   |
| <b>Typhaceae</b>        |   |   |                 |
| Typha                   |   | N | 2/3/4/6/7/8     |
| <b>POLYPODIALES</b>     |   |   |                 |
| <b>Pteridaceae</b>      |   |   |                 |
| Ceratopteris            |   | N | 2/3/4/5/7       |
| <b>Thelypteridaceae</b> |   |   |                 |
| Thelypteris             |   | N | 2/3/7           |
| <b>SALVINIALES</b>      |   |   |                 |
| <b>Salviniaceae</b>     |   |   |                 |
| Azolla                  |   | N | 2/3/4/5/7       |
| Salvinia                | N | N | 1/2/3/4/5/7/8/9 |
| <b>Marsileaceae</b>     |   |   |                 |
| Marsilea                |   | N | 2/4/7           |

**SOLANALES**

**Convolvulaceae**

|           |   |               |
|-----------|---|---------------|
| Evolvulus | N | 4/7/8         |
| Ipomoea   | N | 2/3/4/5/6/7/8 |

**Hydroleaceae**

|          |   |             |
|----------|---|-------------|
| Hydrolea | N | 2/3/4/5/6/7 |
|----------|---|-------------|

**Solanaceae**

|          |   |         |
|----------|---|---------|
| Physalis | N | 4/6/7/8 |
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**ZINGIBERALES**

**Cannaceae**

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**Table S3** Summary of compositional similarities for each taxonomic group in Tocantins and São Francisco Rivers basins, considering only native assemblage (*i*), and the introduction of non-native species and extinction of threatened species (*ii*). Data source and methods are given in the Methods section

| GROUP                  | COMPOSITIONAL SIMILARITY                   |       |
|------------------------|--------------------------------------------|-------|
| <b>Mollusks</b>        | only native                                | 0.081 |
|                        | non-native introduced / threatened extinct | 0.209 |
| <b>Zooplankton</b>     | only native                                | 0.143 |
|                        | threatened extinct                         | 0.154 |
| <b>Crustaceans</b>     | only native                                | 0.316 |
|                        | non-native introduced / threatened extinct | 0.388 |
| <b>Aquatic Insects</b> | only native                                | 0.338 |
|                        | threatened extinct                         | 0.332 |
| <b>Freshwater Fish</b> | only native                                | 0.016 |
|                        | non-native introduced / threatened extinct | 0.056 |
| <b>Amphibians</b>      | only native                                | 0.251 |
|                        | non-native introduced / threatened extinct | 0.263 |
| <b>Reptiles</b>        | only native                                | 0.394 |
|                        | non-native introduced / threatened extinct | 0.452 |
| <b>Aquatic Mammals</b> | only native                                | 0.25  |
|                        | threatened extinct                         | -     |
| <b>Aquatic Plants</b>  | only native                                | 0.188 |
|                        | non-native introduced                      | 0.226 |