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# PROPOSAL FOR THE INCLUSION OF SPOTTED SORUBIM (PINTADO/SURUBIM) (*Pseudoplatystoma corruscans*) ON APPENDIX II OF THE CONVENTION*

Summary:

The Government of Brazil has submitted the attached proposal for the inclusion of the spotted sorubim (pintado/surubim) (*Pseudoplatystoma corruscans*) on Appendix II of CMS.

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# PROPOSAL FOR THE INCLUSION OF SPOTTED SORUBIM (PINTADO/SURUBIM) *(Pseudoplatystoma corruscans)* ON APPENDIX II OF THE CONVENTION

## A. PROPOSAL

Inclusion of the species *Pseudoplatystoma corruscans* (Spix & Agassiz, 1829) in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), during the 15th Meeting of the Conference of the Parties.

The species is listed on the IUCN Red List as Near Threatened (NT), under criterion A2bcde (Salvador, 2023).

In Brazil, the species is officially recognized as threatened (MMA Ordinance No. 148, of July 7, 2022), classified as Vulnerable (VU) under criterion A2bcde, based on an assessment carried out in October 2019 (Burbano et al., 2024, MMA Ordinance No. 148, of July 7, 2022).

In other countries where the species occurs (Bolivia, Paraguay, Argentina and Uruguay), there is an indication of the need for its conservation, as seen in Uruguay (Loureiro et al. 2013), although no official national red lists were found. In Argentina, some regional evaluations carried out by researchers indicate the spotted sorubim as "vulnerable", such as the evaluation by Cordiviola et al. (2009) for the RAMSAR site in the middle Paraná River.

## B. PROPONENT

Government of Brazil

## C. SUPPORTING STATEMENT

### 1. Taxonomy

1.1 Class: Actinopterygii

1.2 Order: Siluriformes

1.3 Family: Pimelodidae

1.4 Genus, species or subspecies, including author and year: *Pseudoplatystoma corruscans* (Spix & Agassiz, 1829)

1.5 Scientific synonyms:

*Sorubim caparary*, *Platystoma corruscans*, *Silurus macrocephalus*, *Platystoma orbignianus*, *Platystoma panthale*, *Platystoma pardalis*

(According to Eschmeyer's Catalog of Fishes of the California Academy of Sciences)

1.6 Common name(s), in all applicable languages used by the Convention:
Brazil: pintado, surubim, surubim-pintado, cambucu, moleque
Argentina, Paraguay and Bolivia: surubí, surubí pintado, surubí a lunares
IUCN: Spotted Sorubim

### 2. Overview

*Pseudoplatystoma corruscans* is a species of Neotropical freshwater catfish, that undertakes long-distance migration (potamodromous fish). It is a top predator and holds relevant importance for commercial, artisanal and sport fishing. The species' distribution covers the São Francisco and La Plata River basins (including the Paraná-Paraguay and Uruguay River drainages), occurring in territories of Argentina, Bolivia, Brazil, Paraguay and Uruguay (Britski

et al., 1999). The global extent of occurrence (EOO) of the species is estimated at 3,957,288 km² (Salvador, 2023). Its seasonal displacements occur between spawning areas (upstream) and growth and feeding areas (downstream) (Sato & Godinho, 2003). Its life cycle depends on long stretches of free-flowing rivers with preserved longitudinal and lateral connectivity. However, *P. corruscans* faces local population declines due to loss of connectivity caused by dams (especially for hydroelectric purposes), reduced water flow, and habitat degradation. In addition, there are genetic risks associated with population fragmentation and hybridization with congener species.

These factors contributed to its classification as Near Threatened globally and Vulnerable in Brazil (Burbano et al., 2024; Salvador, 2023).

The La Plata River basin is considered one of the most dam-fragmented river systems in the world. Binational hydroelectric power plants are observed in at least two regions: Itaipú, on the border between Brazil and Paraguay, and Yacyretá, between Argentina and Paraguay. Another project on the Uruguay River, Garabi-Panambi, can affect migratory routes on this river in the border region between Brazil, Paraguay and Argentina. In addition, the construction of hydroelectric dams in a country can also impact transboundary fish populations by regulating the river flow and fragmenting critical feeding and reproduction areas.

Given its ecological and socioeconomic importance as well as its transboundary migratory behavior, it is recommended that *Pseudoplatystoma corruscans* be included in Appendix II of the Convention on Migratory Species (CMS). This listing would promote international cooperation in the management of migratory route connectivity, coordinated fisheries management, and control of hybridization risks throughout its range.

## 3 Migrations

### 3.1 Kinds of movement, distance, the cyclical and predicable nature of the migration

The pintado (*Pseudoplatystoma corruscans*) performs predictable longitudinal migrations closely associated with the hydrological cycle (spawning). At the onset of the rainy season, adults migrate upstream to spawn in running and shallow waters located in the upper reaches of the main rivers and their tributaries. Following spawning, eggs and larvae are transported downstream by the current to nursery areas such as marginal lagoons and floodplains, where they remain for approximately two years during the early developmental stages. Adult individuals are typically concentrated in the main river channels, where they feed and accumulate energy reserves before the next migratory cycle.

### 3.2 Proportion of the population migrating, and why that is a significant proportion

Virtually the entire population of *Pseudoplatystoma corruscans* relies on long-distance seasonal migrations to complete its life cycle. During spawning season, adults migrate an average of 200 to 400 km upstream towards the headwaters and major tributaries, where reproduction occurs (Fernandes et al., 2023). After spawning, eggs and larvae drift downstream with the current, to marginal lakes and floodplains, which serve as essential nurseries during the early life stages. Juveniles then return to the main river channels as they grow (Machado et al., 2021). This migratory pattern involves nearly the entire population, since reproductive success depends directly on longitudinal connectivity between spawning and growing habitats. When this connectivity is disrupted by dams, the reproductive cycle is interrupted, leading to population decline and loss of genetic diversity in isolated populations (Machado et al., 2021).

Recent studies indicate that, in addition to the impacts caused by large dams, even small hydroelectric power plants (SHPs) can exert significant cumulative effects when built in series, fragmenting long stretches of rivers and disproportionately compromising the persistence of migratory species (Couto et al., 2021). Therefore, the migratory behavior of *Pseudoplatystoma corruscans* should be considered critical and representative of almost the entire population, representing a biologically significant proportion at the species level.

## 4 Biological data (other than migration)

### 4.1 Distribution (current and historical)

The historical distribution of *Pseudoplatystoma corruscans* covers two important hydrographic basins of South America: the São Francisco and La Plata basins (including the Paraná, Paraguay and Uruguay rivers), which extends across all or parts of five countries - Argentina, Bolivia, Brazil, Paraguay and Uruguay (Buitrago-Suárez & Burr, 2007). Currently, there are regular records of the species in the Paraguay River basin (in parts of Bolivia, Brazil and Paraguay) and in the middle São Francisco (Brazil). Sporadic records occur in segments of the lower Paraná River (Argentina and Paraguay), the Uruguay River (Brazil and Uruguay), the upper São Francisco River (Brazil) and in undammed tributaries of the upper Paraná River (Brazil) (Burbano et al., 2024; de Resende, 2003; Salvador, 2023). There is evidence suggesting local extinction of the species in stretches of highly fragmented rivers or in areas under the hydrological influence of large hydroelectric dams, such as in the main tributaries of the upper Paraná River (e.g., Tietê, Grande, Paranapanema and Paranaíba) and in the lower stretches of the São Francisco River.

### 4.2 Population (estimates and trends)

Although there are no robust global estimates of the population size of *Pseudoplatystoma corruscans*, different sources indicate a declining trend throughout its distribution. Fishing landing data show significant reduction since the 1990s in the Paraná-Paraguay and São Francisco basins, reflecting the combined effects of overfishing, habitat loss, and river fragmentation (Fernandes et al., 2023). Genetic studies confirm that populations isolated by dams exhibit lower genetic diversity and a higher kinship coefficient, indicating increased vulnerability and risk of genetic erosion (Machado et al., 2021).

There are documented declines in commercial fishing landings across extensive stretches of the São Francisco River basin, especially in the cascading reservoirs of Sobradinho, Paulo Afonso, Itaparica, Moxotó and Xingó, in addition to the disappearance of the species downstream of the Xingó reservoir. In the Paraná River basin, a similar reduction in landings has been observed, with the absence of the species in some tributaries, such as the Paranapanema River. The Uruguay River basin presents a comparable scenario, showing a sharp decline. These data collectively demonstrate the strong decline of subpopulations in these three basins.

On the other hand, in the upper Paraguay River basin, the subpopulation presents a more favorable situation. However, recent records of congener hybrid individuals - accounting for more than 10% of the sampled individuals in the Miranda River basin - represent a significant threat to the Southern Pantanal. The installation of Small Hydroelectric Power Plants (SHPs), both existing and planned for the region, constitutes an additional risk factor. Based on studies of fish landing, reproduction and the identified threats, population declines are estimated at least 30% in the São Francisco River basin and at least 50% in the Uruguay and Paraná basins over the past 45 years (equivalent to three generations). In the Paraguay basin, there is no evidence of marked population reduction. However, considering the decrease in subpopulations in the Brazilian territory, an overall population reduction of at least 30% is suspected during the same period (Burbano et al., 2024).

4.3 Habitat (short description and trends)

Adult individuals of *P. corruscans* mainly inhabit the bottom of large river channels, while juveniles are more common in meandering rivers and marginal lagoons (Agostinho et al., 2003). The species uses the main channels of large rivers for migration and spawning, while marginal lagoons and floodplains serve as growth and feeding areas for juveniles (recruitment).

4.4 Biological characteristics

*Pseudoplatystoma corruscans* is a large species, reaching up to 182 cm in total length and 100 kg in body weight. It is a piscivorous predator with nocturnal habits (Mello et al., 2009), inhabiting deep stretches and backwaters of large rivers (Burbano et al., 2024).

During the rainy season, it undertakes reproductive migration, exhibiting total spawning and a maximum observed fecundity of 2.5 million oocytes (Agostinho et al., 2003), each measuring approximately 1 mm in diameter (Sato et al., 2003). The species does not provide parental care, and spawning occurs freely in the channels of large rivers. The eggs are transported by the current until hatching, which occurs in approximately 20 hours at 24 °C (Sato et al., 2003). Within the first year, individuals can reach about 55 cm in length. First maturation in females occurs between 1.2 years (L50) and 2.5 years (L100), while males reach maturity between 1.47 years (L50) and 3.13 years (L100), showing marked sexual dimorphism (Balboni et al., 2021). Spawning occurs at the peak of the flood season, and *P*. *corruscans* is one of the last species to reproduce among the fishes of the Pantanal.

4.5 Role of the taxon in its ecosystem

As a top predator, *Pseudoplatystoma corruscans* plays a fundamental role in the modulation of trophic chains and food webs, directly influencing the structure and dynamics of fish communities in the basins where it occurs. Its ecological relevance is accompanied by high socio-economic value, especially in the context of artisanal and commercial fisheries.

## 5. Conservation status and threats

5.1 IUCN Red List Assessment (if available)

It is listed on the IUCN red list as Near Threatened (NT), under criterion A2bcde (Salvador, 2023).

5.2 Equivalent information relevant to conservation status assessment

There are records of a decline in commercial fishing landings across large stretches of the São Francisco basin (including the cascading reservoirs of Sobradinho, Paulo Afonso, Itaparica, Moxotó and Xingó) as well as the disappearance of the species downstream of Xingó. In the Paraná River basin, there was also a strong reduction in landings and in some areas the species no longer appears in catch data, such as in Paranapanema River. The Uruguay basin shows a similar situation, and the species also suffered a strong decline. These data show the strong decline in the subpopulations of the species in these three basins. In the upper Paraguay basin, the subpopulation is in a better situation. The main threats are: (i) dams, which cause fragmentation, habitat reduction, and alteration of natural water flow, (ii) hybridization with congeneric species, resulting from the release or escape of hybrids cultivated in fish farming into natural environments; and (iii) pollution. In addition, overfishing represents an additional threat in some regions. Based on the studies of fish landings, reproduction, and the threats mentioned above, population declines of at least 30% in the São

Francisco River basin and at least 50% in the Uruguay and Paraná basins are suspected over the past 45 years (three generational times). In the Paraguay basin there is no evidence of a marked population reduction. However, hybrids have recently been recorded, accounting for more than 10% of individuals in the Miranda River basin, which represents an important threat in the Southern Pantanal. The SHPs already installed and planned for the region represent an additional threat. Considering the decline of subpopulations within Brazilian territory, a population reduction of at least 30% over the past 45 years is suspected. Thus, *P. corruscans* has been classified as Vulnerable (VU) under criterion A2bcde (Burbano et al., 2024).

5.3 Threats to the population (factors, intensity)

Fragmentation by dams and loss of connectivity – very high intensity. It blocks migratory routes, eliminates spawning areas, and alters essential hydrological pulses, resulting in local population declines and risk of collapse (Machado et al., 2021; Couto et al., 2021);

Genetic erosion in isolated populations – high intensity. Studies have shown a reduction in genetic diversity, smaller effective population size, and greater inbreeding in isolated populations, indicating a risk to long-term persistence (Machado et al., 2021);

Overfishing – high intensity. Historical fishing pressure on large catfish species has caused documented reduction in landings and direct impacts on regional fish stocks (Fernandes et al., 2023);

Hybridization in aquaculture – moderate intensity. Artificial crosses between *Pseudoplatystoma* spp. pose a risk of genetic introgression in natural populations, although the issue remains localized (Fernandes et al., 2023).

Contamination from the improper use of pesticides and the drainage of marginal lagoons are considered additional threats to essential habitats.

5.4 Threats connected especially with migrations

Physical barriers and alteration of the flood pulse disrupt migration routes and the synchrony between the major hydrologic cycle and reproductive cycle events.

5.5 National and international utilization

A large species with high commercial value, *Pseudoplatystoma corruscans* is important in artisanal, commercial and sport fishing. In the upper Paraguay River basin, within the states of Mato Grosso and Mato Grosso do Sul, artisanal professional fishing of *pintado* was estimated at 1,168,388 kg in 2018 (A. Catella, pers. comm., 2020).

## 6. Protection status and species management

6.1 National protection status

In Brazil, *Pseudoplatystoma corruscans* is officially recognized as a threatened species (MMA Ordinance No. 148, of July 7, 2022), classified as Vulnerable (VU) under criterion A2bcde, based on an assessment carried out in October 2019 (Burbano et al., 2024).

In the other countries where the species occur (Bolivia, Paraguay, Argentina and Uruguay), no official national red lists were found. However, there is an indication of the need for its conservation, as in Uruguay (Loureiro et al. 2013) and Argentina (Cordiviola et al., 2009).

6.2 International protection status

No official international protection status currently established.

6.3 Management measures

The following management measures are being implemented in Brazil:

- Federal management via closed fishing season (*defeso*) during the reproductive period.
- Inclusion of the species in two National Action Plans (PANs) for the conservation of endangered species: PAN Alto Rio Paraná and PAN São Francisco.
- Establishment of the Pintado Recovery Plan.

6.4 Habitat conservation

Protected Areas in Brazil: Environmental Protection Area of the Islands and Floodplains of the Paraná River; Ivinhema River Floodplains State Park; Ilha Grande National Park; Pantanal Matogrossense National Park.

6.5 Population monitoring

Monitoring actions are being implemented in the Paraná and São Francisco River basins as part of the activities under the Surubim/Pintado Recovery Plan (MMA Ordinance No. 355 of January 27, 2023). The Plan was developed by the technical-scientific subgroup established within the scope of the Interministerial Working Group (GTI), established by MMA/MAPA Ordinance No. 218, of June 10, 2021 (GTI Species of MMA Ordinance No. 445), and is coordinated by the Ministry of Environment and Climate Change.

## 7. Effects of the proposed amendment

7.1 Anticipated benefits of the amendment

The inclusion of *Pseudoplatystoma corruscans* in Appendix II of the Convention on Migratory Species (CMS) will represent a significant step forward in the conservation of the species and its habitats. This listing will promote international cooperation between the countries of the La Plata Basin, enabling the coordination of actions aimed at fisheries management, the protection of migratory routes, the maintenance of river connectivity and the control of hybrid contamination.

In addition, this measure may facilitate the mobilization of resources and access to international financing, thereby strengthening existing initiatives, such as the National Action Plans (PANs) in Brazil. It will also foster the exchange of monitoring and research data between the countries involved.

Inclusion in the CMS will help to raise awareness of the ecological role of the species as a top predator, whose presence is essential for the trophic structure and dynamics of fish communities, and therefore fundamental to maintaining aquatic ecosystem services. Recent evidence indicates that the genetic integrity and persistence of large migratory populations can only be ensured through the conservation of long-range connectivity and internationally coordinated management of dams and multiple water uses (Couto et al., 2021).

7.2 Potential risks of the amendment

The main risk associated with the inclusion of *Pseudoplatystoma corruscans* in the CMS is the potential resistance from the commercial fisheries and aquaculture sectors, which may interpret the measure as a restriction on their economic activities. Another relevant challenge, that could be minimized by this proposal, is the current lack of effective coordination between the countries where the species occur, which compromises the effectiveness of conservation actions.

Despite these challenges, the benefits of inclusion far outweigh the risks. The establishment of a formal framework for international cooperation between the Parties, in line with existing multilateral commitments, is essential in the face of documented population declines and evidence of genetic diversity loss in populations isolated by dams (Machado et al., 2021).

7.3 Intention of the proponent concerning development of an Agreement or Concerted Action

Lead coordinated actions for the species across its range, aligning National Action Plans, monitoring protocols and data evaluation.

Establish a comprehensive conservation program for the species in the basins where it occurs, articulated with the existing national instruments of the parties involved, to facilitate information exchange, generate new scientific knowledge, and strengthen population management and recovery actions.

## 8. Range States

Brazil, Bolivia, Paraguay, Argentina, Uruguay

## 9. Consultations

## 10. Additional remarks

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