CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Nineteenth meeting of the Conference of the Parties
Panama City (Panama), 14 – 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Include the population of the Brazilian endemic fish *Hypancistrus zebra* Isbrücker & Nijssen, 1991 in CITES Appendix I by meeting the following criteria of Resolution Conf. 9.24 (Rev. CoP17):

Annex 1 B. The wild population has a restricted distribution area and presents:

iii) a high vulnerability to either intrinsic or extrinsic factors

iv) an observed, inferred or projected decrease in:

– the area of distribution;

– the number of individuals;

– the quality of hábitat.

Annex 1 C. A marked decline in the population size in the wild, which has been:

i) observed as ongoing or as having occurred in the past (but with a potential to resume);

ii) inferred or projected on the basis of any one of the following:

– a decrease in quality of habitat;

– levels or patterns of exploitation

B. Proponent

Brazil*

C. Supporting statement

1. Taxonomy

1.1 Class: Actinopterygii

---

* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

1.2 Order: Siluriformes

1.3 Family: Loricariidae

1.4 Genus, species or subspecies, including author and year: *Hypancistrus zebra* Isbrücker & Nijssen, 1991

1.5 Scientific synonyms:

1.6 Common names: English:
French:
Spanish: Imperial zebra (estados brasileños en las regiones del Medio Oeste, Nordeste, Sur y Sudeste), acari-zebra (estados brasileños de Pará y Amazonas), zebrinha (todos los estados brasileños), zebra (todos los estados brasileños), pleco imperial (mercado internacional de acuarios), zebra pleco (mercado internacional de acuarios), L046 (mercado internacional de acuarios), L098 (mercado internacional de acuarios), L173 (mercado internacional de acuarios).

1.7 Code numbers: N/A

2. Overview

This proposal concerns the endemic species of Brazil *Hypancistrus zebra* considered as critically endangered at the national level (MMA, 2014). It can be found in the Amazon basin, specifically in the middle and lower portions of the Xingú river basin, a region highly impacted by the Hydroelectric Power Plant (CH) of Belo Monte. It is a species of international ornamental interest that has a slow growth rate, high mortality rate and low fertility. With the impact caused by the installation of the Belo Monte HPP leading to a reduced flow a section, the species is more vulnerable to capture for the illegal ornamental fish trade. Illegal trade is occurring and around 10,000 individuals/month are trafficked for international trade (Sousa *et al* ., 2021). Taking into account the impact of the construction of the Belo Monte HPP (deterioration of the quality of the habitat) and the excessive illegal capture of the species to meet the international demand for ornamental fish (potential levels of exploitation), it is estimated that, in a period of 10 years (2016-2026), considering an estimated generation time of 2.5 years for this fish, there will be a population decline of more than 80%, with a very high risk of extinction. The species is clearly being significantly affected by international illegal trade and should be subject to particularly strict regulations to prevent and combat this threat and make an important contribution to ensuring its survival in the wild.

3. Species characteristics

3.1 Distribution

Hypancistrus zebra is endemic to Brazil, it is found in the Amazon basin and its distribution is restricted to the middle and lower part of the Xingu river basin, from the region downstream from the Belo Monte waterfalls to upstream from the city of Altamira , in the region known as “Gorgulho da Rita”, in the State of Pará (Fisch-Muller, 2003; ICMBio, 2022; Roman, 2011; Sousa *et al.,* 2021). It has a current extent of occurrence (EOO) calculated at 6,930 km^2, and an area of occupancy (AOO) of 528 km^2 , which includes the registry sites and nearby potential habitats (ICMBio, 2022).

3.2 Habitat

The species is benthic associated with rock crevices (Roman, 2011). Individuals are usually found isolated in shelters, in cracks and cavities in the submerged rocks of the Xingú River. They inhabit shallow places (up to 3 to 4 m deep), with moderate to strong currents and with the eventual presence of few deposited sediments.

3.3 Biological characteristics

Diet

They feed on aquatic invertebrates (mainly sponges and insect larvae, such as Diptera (Chironomidae), algae, and organic debris.

Growth

Hypancistrus zebra has a slow growth and a high mortality rate, it is estimated a minimum longevity of five years in the natural environment (Roman, 2011). The species reaches a total body length of 80 mm to 100 mm (ICMBio, 2022; Sousa *et al.,* 2021).

Reproduction

The generation time is 2.5 years, with seasonal spawning and the reproductive period is long with two peaks throughout the year, in the transitions between the flood/drought periods of the Xingú River (Román, 2011). Fecundity of *H. zebra* is very low, with 8 to 30 eggs per clutch (Sousa *et al.,* 2021). Females reach sexual maturity between the first and second year of life (ICMBio, 2022), with a body size of 40 mm and males of 30 mm (Román, 2011). The males are responsible for spawning in small cavities in the rocks (Zuanon & Rapp Py-Daniel, 2008; Sousa *et al.,* 2021).

Behaviour

Hypancistrus zebra is a sedentary and territorial species. Individuals inhabit very specific rocky crevices that do not occur in all sections of the Xingú River and they defend themselves with high intraspecific aggressiveness. These slits are also used by other species of Loricariidae and other families. Being a small-sized species, it has several natural predators, especially medium-sized and large cichlids, such as *Crenicichla dandara* (LM Sousa, pers. comm., 2022).

3.4 Morphological characteristics

Small species, reaching 8 to 10 cm in total length. Like all Loricariidae, it has a body covered in bony plates and a sucker-shaped ventral mouth. The coloration of this species is unique and easily distinguishable from others, presenting a white body with straight horizontal black stripes.

3.5 Role of the species in its ecosystem

It is an omnivorous species with a carnivorous tendency. It feeds on plant matter, detritus and invertebrates. Because it is small, it is easy prey for larger fish. Like many Loricariidae, it has a role in the nutrient cycle and makes nutrients available to the largest links in the food chain/web.

4. Status and trends

4.1 Habitat trends

The range of the species is completely included in the area directly affected by Belo Monte. After the filling of the reservoir of this Hydroelectric Power Plant in 2016, part of its population was intensely affected upstream of the Pimental dam, due to the transformation of a lotic to lentic habitat. Downstream of Pimental, the species is being impacted by the reduction of the original flow and the loss of the natural regularity of the hydrological cycle, probably having consequences on the reproductive cycle of the species that will lead to a decrease in the population in the coming years (ICMBio, 2022).

4.2 Population size

The species is not rare (Roman, 2011), but is currently infrequent and not very abundant (LM Sousa, pers. comm., 2022). The construction of HPP Belo Monte significantly altered the habitat of the species. Despite the changes resulting from the implementation of the HPP Belo Monte, specimens can still be found in some places (LM Sousa, pers. comm., 2022) and the seizures made by the Federal Police in the years 2021 and 2022 show many juvenile specimens, certainly born after the implementation of the HPP. This fact shows that, currently, the populations are managing to maintain

themselves in remnant areas of the Volta Grande do Xingu rapids and that illegal harvesting is a strong pressure and threat to the species. Taking into account the impact of the construction of the Belo Monte HPP (deterioration of the quality of the habitat) and the excessive illegal capture of the species to meet the international demand for ornamental fish (potential levels of exploitation), it is estimated that in a period of 10 years (2016-2026), considering an estimated generation time of 2.5 years for this fish, there will be a population decline of more than 80%, with a very high risk of extinction (ICMBio, 2022).

4.3 Population structure

Habitat loss and overfishing characterize the current scenario that threatens *H. zebra* populations. However, data on population structure are still scarce. The environmental variations resulting from extreme droughts, floods, among other natural catastrophes, can generate variations in the birth and death rates, in addition to the unpredictable availability of resources, causing large and continuous subdivisions of populations, or even extinguishing some populations. The main reservoir of the Xingu River transformed the environment of the population of the "Gorgulho da Rita" region from lotic (characterized by running waters, with constant flow, such as rivers and streams) to lentic (characterized by calm waters or low flow, such as lakes, ponds, puddles and reservoirs). Permanent flooding above the natural level has been submerging the rapids and rocks, consequently reducing the surface turbulence and the speed of the water. The accumulation of fine sediments in the rocks affects benthic environments, restricting the availability of space and food, which affects the reproductive process and increases population mortality. The reduction of resources is not limited to the population of the "Gorgulho da Rita" region. Changes in the hydrological regime and ecological conditions affect the other populations of the species, as can attest the great disturbance in the population located in the rest of its original range.

4.4 Population trends

Observations made between 1990 and 1997 indicated a trend of strong population decline, which can be attributed to overfishing for the aquarium market (JAS Zuanon, pers. comm., 2012). In 2004, in the assessment of threatened species in Brazil, the species was considered Vulnerable (VU) due to the impacts generated mainly by its commercial extraction and the capture of the species was prohibited. In 2014, the species was recategorized as Critically Endangered (CR).

4.5 Geographic trends

Trends towards a reduction its range as a consequence of the changes caused by the Belo Monte HPP in the region.

5. Threats

Hypancistrus zebra is a species of ornamental interest and historically its main threat until 2004 was overexploitation for the international ornamental fish trade. Currently, in addition to the pressure of illegal capture for the ornamental fish trade, there is also the threat of habitat alteration due to the implementation of the HPP of Belo Monte. The whole range of the species is in the area directly affected by this HPP (with an extension of 407 km ^{2}). After the filling of the Belo Monte HPP reservoir in 2016, part of the population of this species was intensely affected upstream of the Pimental dam, due to the transformation of the lotic to lentic habitat (LM Sousa, pers. comm., 2019). Downstream of Pimental, the species is being impacted by the reduction of the original flow and the loss of the hydrological cycle, which, according to experts, may have consequences on the reproductive cycle of the species that will lead to a decrease in the population in the coming years (ICMBIO, 2022). In addition, in the low flow section, the species is more vulnerable to capture for the illegal ornamental fish trade. Despite the prohibition to capture this species in the country, and the efforts of the authorities at the national level, illegal fishing continues and around 10,000 individuals/month are trafficked via Colombia (Sousa *et al.,* 2021), from where they are regularly exported, which has a strong impact on their population (ICMBio, 2022).

6. Utilization and trade

6.1 National utilization

The species is not used legally in the national territory.

6.2 Legal trade

The species has been bred in captivity since the late 1990s in Europe and the United States of America. Starting in 2000, the species has started being bred on a large scale in Indonesia (L. Sousa *et al.,* 2021) and is also now on a large scale in Ukraine and the Czech Republic (LM Sousa, pers. comm., 2022). Since 2017, with the inclusion of this species in Appendix III of CITES, all legal trade between countries must be declared and reported.

6.3 Parts and derivatives in trade

The trade of this species is carried out only in whole and live individuals.

6.4 Illegal trade

Sousa *et al* . (2021) conducted extensive research and reported that the main trafficking route is through countries bordering Brazil, especially Colombia and Peru. The animals are smuggled by air and/or river from Altamira (PA) to Tabatinga and/or Santo Antônio do Içá, (AM), from where they cross the border to the municipality of Leticia, Colombia. In international territory, depending on the country, local laws do not classify *Hypancistrus zebra* as a prohibited species, thus facilitating international trade from there. One of the national inspection agencies, IBAMA, records the seizure of 4,115 specimens of *H. zebra* (Table 1).

Table 1: Number of specimens of *H. zebra* seized by IBAMA between 2006 and 2019.

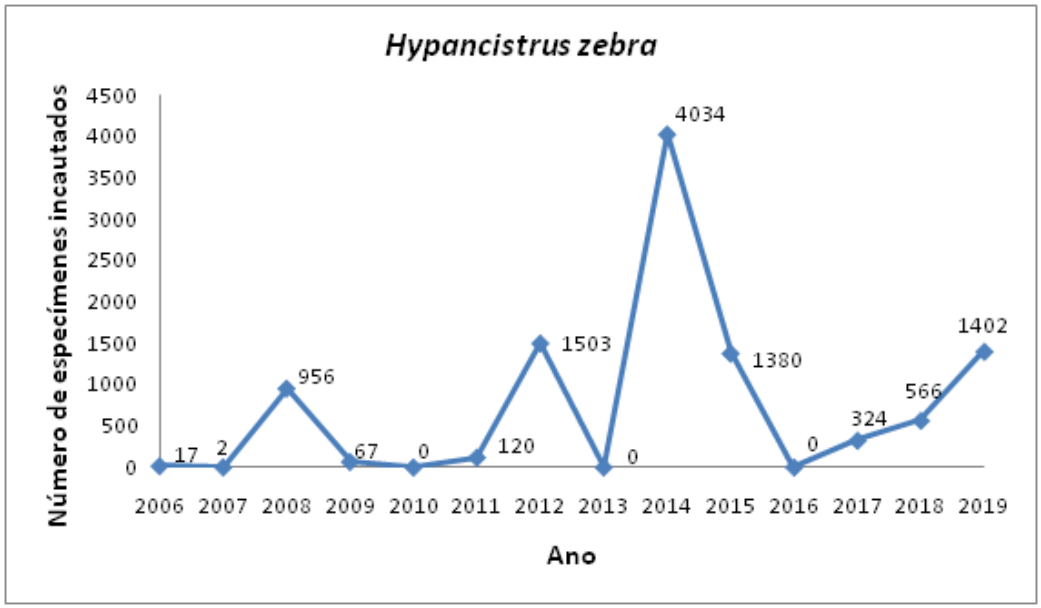
Year of arrest	Number of *H. zebra* seized
2006	**17**
2007	**two**
2008	**80**
2009	**67**
2011	**105**
2012	**1478**
2014	**819**
2015	**740**
2017	**302**
2019	**505**
TOTAL	**4115**

However, these numbers do not reflect all the seizures, since the information is not centralized in a single institution.

Studies carried out by Beltrão et al., (2021), with the aim of evaluating the situation of illegal trafficking of ornamental fish in the Brazilian Amazon using the available data on seizures by the Federal Police and IBAMA, in the period between 2003 and 2020, records that the most seized species was *H. zebra*, present in 44.6% of the seizures made.

Compiling the seizure data from these two sources, the following graph shows the number of specimens of *H. zebra* seized during inspections between 2006 and 2019 (Graph 1).

Graph 1: Number of specimens of *H. zebra* seized by IBAMA and the Federal Police between 2006 and 2019, according to the combination of data presented in Beltrão 2021 and IBAMA.



We emphasize that these numbers only reflect the part of the illegal catch that was seized. The total number of specimens captured for the illegal trade is certainly much higher. The inclusion of this species in Appendix I of CITES would help avoid this legal trade outside of Brazil.

6.5 Actual or potential trade impacts

Trade in this species already occurs legally on a large scale throughout the world (except in Brazil). Animals legally traded internationally supposedly come from captive breeding, whose techniques have been perfected for decades. Prohibition of trade in any and all wild specimens is imperative for the conservation of the remaining populations.

7. Legal instruments

7.1 National

In Brazil, the species is protected from capture in the wild, and has been considered threatened since 2005, initially by the MMA Normative Instruction No. 05, of May 21, 2004, and later by the MMA Ordinance No. 445, of December 17, 2014. The species is included in the National Action Plan for the Conservation of Endangered Species of Amazon Fish - PAN Amazon Fish, approved by ICMBio Ordinance No. 374/2019, coordinated by the National Center for Research and Conservation of Amazon Biodiversity (ICMBio /CEPAM). National laws and regulations related to the use of species for aquariums and endangered species:

- The Federal Constitution, Environment Chapter (article 225);
- Federal Fauna Law 5,197 of 1967;
- Federal Ordinance CITES 76.623 of 1975;
- Law 6,938 of 1981, dictates the National Environmental Policy;
- Environmental Criminal Law (Federal) 9,605 of 1998;
- Execution of the Federal Ordinance CITES 3607 of 2000;

- Ordinance 2,519 of 1998, which promulgates the Convention on Biological Diversity (CBD);

- SAP/MAPA Ordinance 17 of January 26, 2021, which establishes norms, criteria and standards for the sustainable use of native fish from inland, marine and estuarine waters, for ornamental and aquarium purposes;

- MMA Ordinance No. 445 of December 17, 2014, modified by MMA Ordinance 98/2015, MMA ORDINANCE No. 163/2015, which recognizes as threatened species of fish and aquatic invertebrates of the Brazilian fauna those included in the "Official National List of Threatened Aquatic Fauna Species";

- Ordinance No. 374, of August 1, 2019, which approves the National Action Plan for the Conservation of Endangered Fish Species in the Amazon - PAN Peces Amazónicos, which covers 38 taxa threatened with extinction, establishing its general objective, specific objectives, species concerned, term of implementation, forms of implementation, monitoring and evaluation, and establishes the Technical Advisory Group.

7.2 International

The species was included in Appendix III in 2017 year in order to improve the monitoring of international trade because of the potential threat to the species. Brazil is a signatory to CITES and the Convention on Biological Diversity (CBD) and the national laws for the implementation of both conventions are:

- Federal Ordinance CITES 76.623 of 1975;

- Execution of the Federal Ordinance CITES 3607 of 2000;

- Ordinance 2,519 of 1998, Convention on Biological Diversity (CBD).

8. Species management

8.1 Management measures

The species has been listed as endangered in Brazil since 2005, and the capture, transport, and trade of wild-caught specimens are prohibited. No export permits have been issued for their breeding in captivity, since the CITES Management Authority needs to guarantee the legal acquisition of the breeding stock and verify the regularization of these operations in accordance with Brazilian regulations.

8.2 Population monitoring

There is no formally established long-term population monitoring plan.

8.3 Control measures

8.3.1 International

In Brazil, there is no permit to export wild-caught specimens and there is no regular captive breeding for this species. As a consequence, any export of the species for commercial purposes is illegal.

8.3.2 Domestic

In Brazil, the capture, transport and trade of wild-caught *H. zebra specimens* are prohibited and there is no registered facility for the breeding of this species in captivity.

8.4 Captive breeding and artificial propagation

In Brazil, commercial breeding of endangered species in captivity is not allowed. Although there is already technology for the reproduction and rearing of the species, there are still no regularized

producers in Brazil, which would require the creation of new norms to regulate this type of activity, including species considered to be in danger of extinction.

The species is contemplated in the Technical Cooperation Agreement (No. 3202386) signed between the Chico Mendes Institute for the Conservation of Biodiversity - ICMBio, the Brazilian Zoo Society - SZB and the Ministry of the Environment - MMA, whose objective is to prepare , implement, maintain and coordinate Ex-situ Management Programs for Endangered Species in Zoos and Aquariums in Brazil.

The species has been bred in captivity since the late 1990s on a small scale in Europe and the United States of America. Starting in 2000, the species has started being bred on a large scale in Indonesia (Sousa et al., 2021) and is also now bred on a large scale in Ukraine and the Czech Republic (LM Sousa, pers. comm., 2022).

8.5 Habitat conservation

The habitat of the species is under strong anthropic pressure and its water dynamics are changing, since it is the area directly affected by the installation and operation of the Belo Monte HPP.

8.6 Safeguards

They do not apply to this proposed amendment.

9. Information on similar species

Hypancistrus zebra is very different from other species of the family and even from the same genus. The identification of this species is easy even for non-specialists.

10. Consultations

As it is a species endemic to Brazil, this first draft proposal was prepared by ICMBio/CEPAM with the support of IBAMA and Brazilian specialists in the species. There were no consultations until the proposal was submitted to the CITES Secretariat.

11. Additional remarks

N/A

12. References

Beltrão, Hélio et al. Trafficking of ornamental fish in the brazilian amazon . Bulletin of the Fisheries Institute, [Sl], v. 47, Nov. 2021. ISSN 1678-2305. Available at: < https://www.pesca.sp.gov.br/boletim/index.php/bip/article/view/1621 >. Date accessed: May 13, 2022. doi: https://doi.org/10.20950/1678-2305/bip.2021.47.e639 .

Conservation International , 2009. Rare Fishes. Brazil Rare Fish Project, available at: http://peixesraros.conservation.org.br/livro.php. Accessed on: 03/20/2012.

Fisch-Muller, S., 2003. Subfamily Ancistrinae. pp.373-400. In: Reis & Kullander. Checklist of Freshwater Fishes of South and Central America, EDIPUCRS. 756p

ICMBio, 2022. Biodiversity Extinction Risk Assessment System – SALVE. Available at: https:// salve .icmbio.gov.br/salve/. Accessed on: May 24. of 2022.

, IJH . Nijssen, H., 1991. *Hypancistrus zebra* , a new genus and species of uniquely pigmented ancistrine loricariid fish from the Xingu River, Brazil (Pisces: Siluriformes: Loricariidae). Ichthyol. explore Aguas Dulces, p.345-350.

MMA, 2004, 05/21/2004. Normative Instruction No. 5, of May 21, 2004. Recognizes species in danger of extinction and overexploited or threatened by overexploitation. p.136--142. Available at: https://www.icmbio.gov.br/cepsul/images/stories/legislacao/Instrucao_normativa/2004/in_mma_05_2004_speciesdeinvertebradosaquaticossepeixesameacadosdeextincaoesobreexplotada_altrd_in_mma_52_2005.pdf . Accessed on: 09/04/2013.

MMA, 2014, 12/17/2014. ORDINANCE No. 445, of December 17, 2014. Official Gazette of the Federation No. 245, of December 18, 2014. Section 1, pages 126-130 – The Official National List of Fish and Aquatic Invertebrates in Danger of Extinction.

Portela, G. 1988. Fish Collection of the Zoology Museum of USP - MZUSP. Available at: http://www.splink.gov.br. Accessed on: 12/13/2019.

Roman, APO, 2011. Reproductive biology and population dynamics of *Hypancistrus zebra* Isbrücker & Nijssen, 1991 (Siluriformes, Loricariidae) in the Xingu River, Brazilian Amazon . Master's Thesis. UFPA - Federal University of Pará .

Sousa, L.M.; Lucas, O.; Arroyu-Morra, JP; Kalascka, M. 2021. Conservation and trade of the endangered Hypancistrus zebra (Siluriformes, Loricariidae), one of the most trafficked Brazilian fish. Global Ecology and Conservation 27: e 01570. https://doi.org/10.1016/j.gecco.2021.e01570.

Zuanon, J. Rapp Py-Daniel, LH, 2008. *Hypancistrus zebra* Isbrucker&Nijssen, 1991. In: Machado *et al* . Red Book of Endangered Brazilian Fauna , Fundação Biodiversitas