Contributions to the Knowledge of Freshwater Stingrays of the Brazilian Amazon

Guillermo M.B. Estupiñán – WCS Brasil
9 August 2016

Amazon Freshwater Stingrays

In the literature, the number of species of freshwater stingrays of the Family Potamotrygonidae ranges from 20 to 28 in four genera.[1–4] In a document prepared by the Alexander von Humboldt Institute for CITES[3], 19 species of the Family Potamotrygonidae occur in the Amazon.

In terms of classification it is necessary to invest efforts to better understand this family. The species *Potamotrygon motoro*, *Potamotrygon orbignyi*, and *Paratrygon aiereba* are understood to be a species complex, while the taxonomy of *Potamotrygon dumerilii* and *Potamotrygon humerosa* is recognized as uncertain.[3]

New *Potamotrygon* species have been described for Ilha de Marajó (two), in Amazonas estuary[2]; *P. tatianae* for Madre de Dios river, Madeira river basin[4], and another recently described for rio Negro (*P. wallacei*)[1].

Fisheries

Conflict between freshwater stingrays arise through accidents with swimmers on beaches and with fishermen [2,5].

Freshwater stingrays are occasionally used as bait in fishing piracatinga[6]. In Amazonas state, stingrays are not much consumed[7], but in the state of Pará, there is important fishing for direct consumption[8]. Using data from the fisheries landings monitoring in Amazonas and Pará between 2001 and 2004, there is evidence that the catches are increasing in the Amazon [8,9 ,10].

Landings data from the Amazon estuary region report that in 2001, 9 tons of freshwater stingrays were landed, and 18 tons were landed in 2002. Over the period analyzed (2001-2004), the production in this macro-region showed a trend of increased production for freshwater stingrays, including lower Amazon [8].

Use as Ornamental

Although freshwater stingrays are not the main group of species in the South American ornamental trade, they are important in the riverine economy [5].

In mid-2010, the state of Amazonas was the major region producing ornamental fishes, but the departure of the main export company market led to a decline of approximately 90% in the exported

volume.

Approximately 169 species from the Rio Negro are of ornamental use; eleven of these comprised 90% of the total volume, while freshwater stingrays were in the group of 113 species comprising less than 5% of this trade by 2003[11].

Currently, thousands of freshwater stingrays, especially *P. motoro*. are exported from Brazil, Colombia and Peru. Colombia and Peru are the largest exporting countries, with over 12,000 and between 10,000-40,000 specimens exported in 2009, respectively, and 5,286 exported from Brazil (Table 1). There is also a large illegal trade of freshwater stingrays from Brazil - in violation of the legal quotas[12].

An example is the case of other species being smuggled in small basins flights to Colombia (http://g1.globo.com/am/amazonas/noticia/2015/11/policia-prende-homem-e-apreende-peixes-ornamentais-no-amazonas.html). This case involved a more serious issue, namely the release of the confiscated stingrays in the Tapajós River, probably in the Upper Solimões River, near the border with Colombia.

Brazilian freshwater stingray exports between 2009 and 2016 were analyzed from data provided by IBAMA. A total of seven states were recorded as sources of 37,506 freshwater stingrays exported during this period (Table 1). Exports of freshwater stingrays decreased between the period 2001-2002 (only Amazonas state exports)[11] and the period 2009-2016 (seven states exporting) (Figure 1).

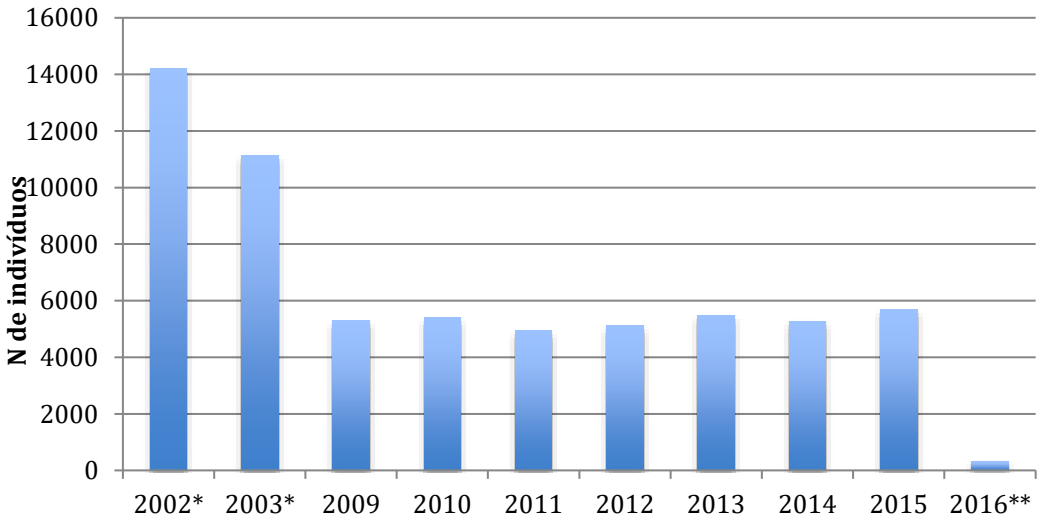

Figure 1. Exports of freshwater stingrays from Brazilian Amazon in the periods 2002-2003[11] and 2009-2016 (IBAMA). **until February 2016.

Table 1. Freshwater Stingrays exports by Brazilian state: Amazonas (AM), Ceara (CE), Espirito Santo (ES), Goiás (GO), Pará (PA), Rio de Janeiro (RJ) e São Paulo (SP) between 2009 and 2016. Source: IBAMA.

Ano	AM	CE	ES	GO	PA	RJ	SP	Total
2009	1290	2			3781	38	175	**5286**
2010	1066		74		4241		21	**5402**
2011	1462		77		3372		40	**4951**
2012	1259		60	5	3794			**5118**
2013	246		147		5091			**5484**

2014	1045	93	13		4096			**5247**
2015	2511	58			3121			**5690**
2016*		21			307			**328**
Total	**8879**	**174**	**371**	**5**	**27803**	**38**	**236**	**37506**

* until February 2016.

The largest export volumes are from Para and Amazonas, with 74.1% and 23.7%, respectively, and the remaining states grouped in the "other" category, with 2.2% (Figure 2).

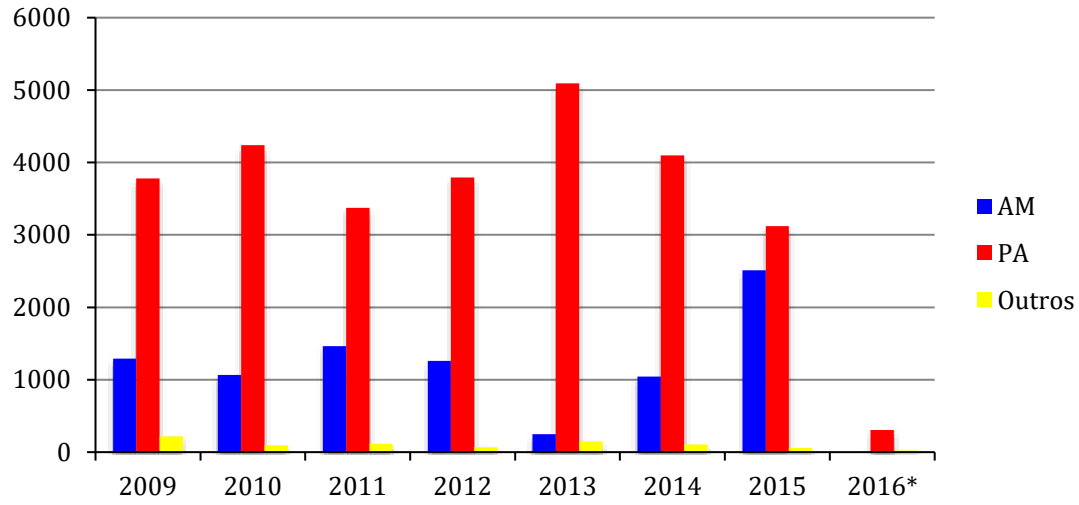

Figure 2. Volumes of Freshwater Stingrays exported between 2009 and 2016 by the Brazilian states of Para, Amazonas and five others. *Until February 2016. Source: IBAMA

IBAMA reported exports of six species of the genus *Potamotrygon*: *P. leopoldi* the most traded 67.3%), followed by *P.* cf *histrix* (22.6%), *P. henlei* (5.7%), and *P. motoro* (3.9%) (Table 2).

Table 2. Stingray species of the genus *Potamotrygon* exported from Brazilian Amazon between 2009 and 2016. Source: IBAMA.

	P. cf. henlei	***P. cf. histrix***	***P. leopoldi***	***P. motoro***	***P. orbignyi***	***P. shroedery***	***Total***
2002*		6478		5030	1724	962	**14194**
2003*	24	4488		4976	1431	209	**11128**
2009	230	1286	3551	170	49		**5286**
2010	908	1019	3222	156	94	3	**5402**
2011	155	1381	3287	120	8		**4951**
2012	76	1236	3498	306	2		**5118**
2013	297	232	4861	79	15		**5484**
2014	130	1032	4006	79			**5247**
2015	345	2275	2540	530			**5690**
2016**	6		291	31			**328**
Total	**2171**	**19427**	**25256**	**11477**	**3323**	**1174**	**62828**

*Data only for Amazonas State. **Until February 2016.

Destination countries for freshwater stingrays exported from the Brazilian Amazon totalled 35 on 4 continents – Asia, Europe, North America, and Africa, the latter with less than 0.01% (Figure 3).

Asia, especially Thailand and Hong Kong, is the main destination; followed by Germany (Europe) and the USA.

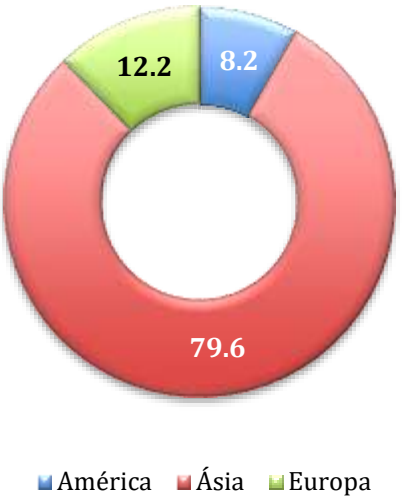

Figure 3. Destination Continents for freshwater stingrays exported by Brazil between 2009 and 2016. Source: IBAMA.

Overall, eight countries imported ca. 91% of stingrays exported from Brazil: Thailand, Hong Kong, Taiwan, Germany, USA, Japan, South Korea and China (Figures 4 and 5).

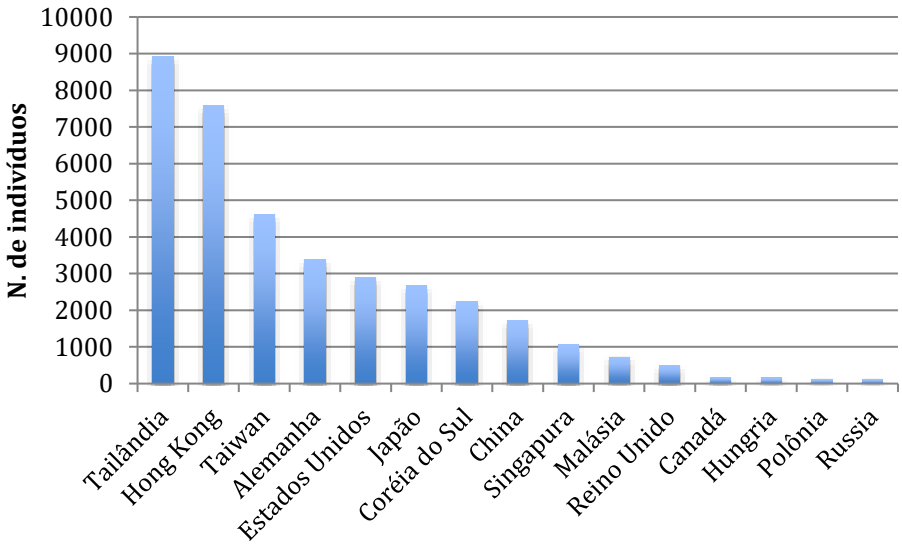

Figure 4. Main destination for stingrays exported by Brazil between 2009 and 2016. Source: IBAMA.

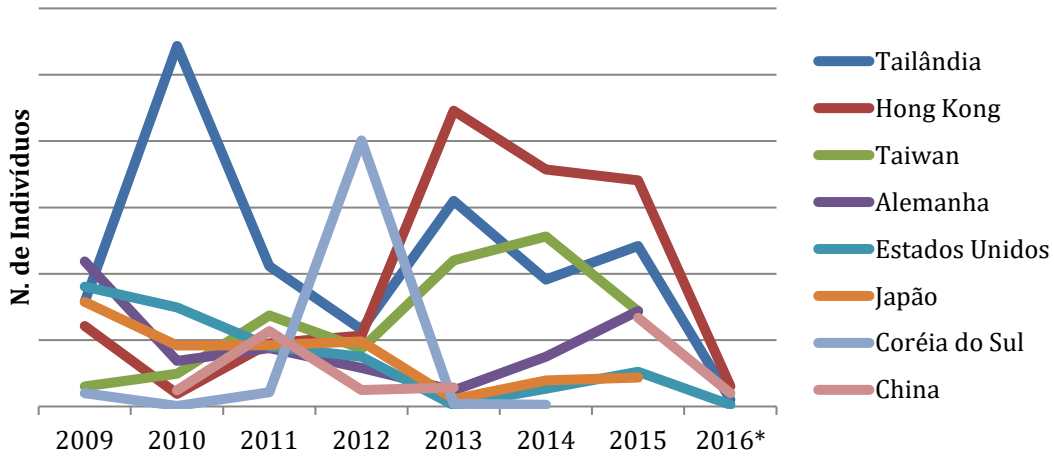

Figure 5. Annual distribution of the main destinations for freshwater stingrays exported by Brazil between 2009 and 2016. Source: IBAMA.

Conclusions and Recommendations

The trade in freshwater stingrays as ornamentals is small in relation to the total volume of ornamental fishes originating from the Brazilian Amazon.

Exports of freshwater stingrays from the Brazilian Amazon decreased considerably between the periods 2002-2003 and 2009-2016. A factor in this decline was the departure of large exporting companies.

The illegal international trade from Brazil is apparently large and may also be leading to the release – and introduction – of species in river basins outside of their natural ranges.

Seizures data are collected by IBAMA but have not yet been available for analysis. These data can give a better idea of the amount of fishes that are illegally exported.

The official data as collected by environment agencies (IBAMA) do not detail the origin of the fishes in trade, and it is necessary to coordinate with other institutions such as the farm office, sending invoices on the source, or the companies themselves.

Consumption of freshwater stingrays for food is great in the lower Amazon and Para. Recent observations of greater availability of freshwater stingrays in restaurants in Manaus may be indicative of increased fishing effort of this group.

Surveys of markets and restaurants in Manaus should collect evidence of trends in trade in freshwater stingrays for human consumption.

Management agencies should discuss the recording and monitoring of ornamental fish in order to be integrated with the tax inspection standards and processes.

Additional efforts to clarify the taxonomy of the Family Potamotrygonidae should be encouraged.

References

1. Carvalho, M. R., Rosa, R. D. S. & Araújo, M. L. G. A new species of Neotropical freshwater stingray (Chondrichtyes: Potamotrygonidae) from the Rio Negro, Amazonas, Brazil: the smallest species of Potamotrygon. *Zootaxa* **4107,** 566–586 (2016).
2. Almeida, M. P. de, Barthem, R. B., Viana, A. da S. & Charvet-Almeida, P. Factors affecting the distribution and abundance of freshwater stingrays (Chondrichthyes : Potamotrygonidae) at Marajó Island , mouth of the Amazon River. *Panam. J. Aquat. Sci.* **4,** 1–11 (2009).
3. Institute Alexander von Humboldt. *Freshwater Stingray (Family Potamotrygonidae) Expert Workshop - CITES Working Group*. **32,** (2014).
4. Silva, J. P. C. B. da & Carvalho, M. R. de. A new species of Neotropical freshwater stingray of the genus Potamotrygon Garman, 1877 from the Río Madrede Díos, Peru (Chondrichthyes: Potamotrygonidae). *Papéis Avulsos Zool. (São Paulo)* **51,** 139–154 (2011).
5. Araújo, M. L. G., Charvet-Almeida, P., Almeida, M. P. & Pereira, H. Freshwater stingrays (Potamotrygonidae): status, conservation and management challenges. *Inf. Doc. AC* **20,** 1–6 (2004).
6. Brum, S. M., Silva, V. M. F., Rossoni, F. & Castello, L. Use of dolphins and caimans as bait for Calophysus macropterus (Lichtenstein, 1819) (Siluriforme: Pimelodidae) in the Amazon. *J. Appl. Ichthyol.* 1–6 (2015). doi:10.1111/jai.12772
7. Ferreira, E. J. G., Zuanon, J. A. S. & Santos, G. M. dos. *Peixes comerciais do médio Amazonas: região de Santarém*. (IBAMA, 1998).
8. Batista, V. da S. *et al. Peixes e Pesca no Solimões-Amazonas: Uma Avaliação Integrada*. (IBAMA, 2012).
9. Ruffino, M. L. *et al.* Estatística Pesqueira do Amazonas e Pará 2002. *Statew. Agric. L. Use Baseline 2015* **1,** (2005).
10. Thomé-souza, M. J. F. *et al.* Estatística Pesqueira do Amazonas e Pará 2004. *ProVárzea/IBAMA* (2007).
11. Anjos, H. D. B. dos, Amorim, R. M. de S., Siqueira, J. A. & Anjos, C. R. dos. EXPORTAÇÃO DE PEIXES ORNAMENTAIS DO ESTADO DO AMAZONAS, BACIA AMAZÔNICA, BRASIL. *B. Inst. Pesca* **35,** 259–274 (2009).
12. WCS. *WCS Position Statement CITES CoP17 - Johannesburg, South Africa*. (2016).