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EVIDENCE

Fishes and cowboy boots: An optimistic view

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Abstract

The community-based management of Arapaima gigas for sustainable commercial use allows that wild fish legally harvested in the Brazilian Amazon supply the demand for exotic leather in the US, supporting the conservation of the forest and providing income for fishers communities if based in fair-trade. We provide a more optimistic view than Heinrich et al. (2019) on the effects of international trade of arapaima leather in the conservation of the species in Brazil.

KEYWORDS

Arapaima gigas, Brazilian Amazon, community-based management, conservation, fair-trade, leather, pirarucu, US import

1 | EVIDENCE PIECE

We would like to commend and thank Heinrich, Ross, and Cassey (2019) for their research on US trade in exotic leather, in the article entitled "Of cowboys, fish, and pangolins: US trade in exotic leather" (DOI: 10.1111/csp2.75). The authors conclude that arapaima leather is increasingly used on the US market and raise concerns

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about the sustainability of the trade. Here, we would like to highlight the current conservation context of arapaima in Brazil, the main source of leather from wild caught arapaima to the US, and suggest a more optimistic scenario on the impacts of arapaima leather exports from Brazil to the US.

While drastic population declines of arapaima did occur in the 1990s before fishing regulations were implemented, arapaima is currently one of the most promising species for sustainable use in the Amazon. Large-scale population recovery has been documented in many areas (eg. Campos-Silva & Peres, 2016; Castello, Viana, Watkins, Pinedo-Vasquez, & Luzadis, 2009; Petersen, Brum, Rossoni, Silveira, & Castello, 2016), reaching over 420% in some locations (Campos-Silva, Hawes, & Peres, 2019). Even outside protected areas, wild populations have recovered following the establishment of no-take areas fully protected by indigenous peoples and traditional communities (Campos-Silva et al., 2019), although declining trends in landings and size of arapaima can also be found outside community-based arrangements (Cavole, Arantes, & Castello, 2015). In addition to arapaima, other species including black caiman (*Melanosuchus niger*) and freshwater turtles (*Podocnemis expansa* and *P. sexturbeculata*) benefit from habitat protection by local communities and are more abundant in managed areas relative to open-access lakes (Campos-Silva & Peres, 2016; Miorando, Rebêlo, Pignati, & Pezzuti, 2013). Besides biodiversity conservation outcomes, arapaima management induces significant social transformation in the Amazon, substantially improving local quality of life through income generation, reduction of gender inequality, cultural maintenance, and other benefits (Campos-Silva & Peres, 2016; Freitas et al., 2019). It is important to highlight the social and ecological benefits from community-based management of arapaima to build conservation optimism instead only a doom and gloom narrative.

Despite these significant and well-documented social and ecological benefits, the commercial value paid to arapaima fishers is low, often not even covering the cost of the activity. The key to maintaining and strengthening this successful model is therefore fair trade—a market that pays a fair value to fishers and supports their commitment in protecting arapaima habitats. Since 2017, near 20,000 units of arapaima leather were annually exported with permits from managed areas in Brazil to the US (IBAMA unpublished data), generating important income along the arapaima value chain. The income from leather could add to the price paid to the fishers and cover much of the management cost bottleneck, ensuring long-term benefits to managed areas. Although promising, leather selling accounts for only 20% of the arapaima revenue and this profits usually do not benefit the fishers in the frontline. Fish processors and tanneries take the lion's share of the profits in leather trade while fishers' bear the cost of production and management.

The Brazilian environmental agency, IBAMA, regulates both the arapaima harvest quotas granted to communities that protect lakes and manage fish populations and the arapaima leather trade, such that only sustainably managed fish captured within the scientifically set quotas can be legally exported. Currently, communities do not harvest up to the legally set quotas (IBAMA unpublished data), which are themselves already quite conservative, below biologically sustainable levels. In sum, the sustainable harvesting of arapaima for meat and skin production is currently a fantastic opportunity to reconcile biodiversity conservation and local development.

The authors of this Evidence piece represent a diverse group of researchers, indigenous and traditional population, local associations, NGOs, Brazilian government agencies, and environmental leaders who have been working for decades to reconcile the conservation of arapaima with the welfare of local communities. According to our analysis and experience, exporting arapaima leather to produce cowboy boots and other clothing and accessories could make a positive contribution to arapaima conservation, if the skins continue to be sourced from legally managed areas, as has been the case to date, and if fishers are fairly remunerated for their labor and contribution to biodiversity conservation.

CONFLICT OF INTEREST

The authors declare no conflict of interest to report.

AUTHOR CONTRIBUTIONS

Pedro de Araujo Lima Constantino, João Vitor Campos-Silva, and Kirsten Silvius conceived and wrote the manuscript first draft. João da Mata Nunes Rocha and Bruna De Vita Silva Santos edited the following versions. Fernanda Alvarenga, Leonardo Kurihara, Felipe Rossoni, Ana Claudia Torres, and Antônio Adevaldo Dias da Costa compiled socio-economic and management information. Cristina Isis Buck Silva and Sara Quizia Corrêa Mota provided information on fish harvesting and skin trade.

ETHICS STATEMENT

No ethics review for animal handling or human subject research was necessary for the work reported on this Evidence piece.

DATA AVAILABILITY STATEMENT

No data were explicitly analyzed in the production of this work. The unpublished information on pirarucu harvest and skin trade are available upon request to IBAMA.

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